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ANDHRA PRADESH GOVERNMENT ARCHAEOLOGICAL SERIES

No. 1

"PIKLIHAL EXCAVATIONS"

1700

by
Dr. F. R. ALLCHIN, M.A., Ph.D., F.S.A. (London)
University Lecturer in Indian Studies,
University of Cambridge

S.V. UNIVERSITY ORIENTAL RESEARCH INSTITUTE
TIRUPATI
JUL 197

General Editor:
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Hyderabad

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71.097

PUBLISHED
BY
THE GOVERNMENT OF ANDHRA PRADESH
HYDERABAD

1960

Printed at
THE BAPTIST MISSION PRESS
41A Acharyya Jagadish Bose Road, Calcutta 16

Price: Rs.15

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ABBREVIATIONS

A.R.H.A.D.	..	Annual Report of the Hyderabad Archaeological Department
B.D.C.R.I.	..	Bulletin of the Deccan College Research Institute
B.S.O.A.S.	..	Bulletin of the School of Oriental and African Studies, London
H.A.S.	..	Hyderabad Archaeological Series
I.A.A.R.	..	Institute of Archaeology (London), Annual Report
I.P.P.A.	..	Indian Prehistoric and Protohistoric Antiquities (the Foote Collection)
J.A.S.B.	..	Journal of the Asiatic Society of Bengal
J.B.B.R.A.S.	..	Journal of the Bombay Branch of the Royal Asiatic Society
J.H.A.S.	..	Journal of the Hyderabad Archaeological Society
J.H.G.S.	..	Journal of the Hyderabad Geological Survey
J.I.A.I.	..	Journal of Indian Art and Industry
J.R.A.I.	..	Journal of the Royal Anthropological Institute
M.A.S.I.	..	Memoirs of the Archaeological Survey of India
M.G.S.I.	..	Memoirs of the Geological Survey of India
U.T.A.K.E.	..	Uzno-Turkmenistanskoi Arkheologicheskoi Kompleksnoi Ekspeditsii.

INTRODUCTION

In 1952 when my wife and I first visited the Raichur Doāb it must have ranked as one of the most well explored districts in Southern India, containing no less than seventy sites, of which notice was already published. In spite of this and of the fact that large-scale excavations had been carried out at at least two places, very little had been done to gather and analyse the information; so that the culture sequence proposed by Foote in 1887,[1] and refined by him in 1895,[2] still formed the basis for any descriptive account. Only in 1947 did Sir Mortimer Wheeler's excavations at Brahmagiri provide a stratigraphical demonstration of Foote's correctness and herald a new era in Deccan archaeology. I shall consider the history of archaeological research in some detail when I turn, in a later volume, to the Gazetteer of sites in the Doāb. Here it suffices to notice that the first discovery of stone artifacts in India appears to have been made at Lingsugur in 1842; that Col. Meadows Taylor resided in the neighbourhood for many years and published for the first time an account of the grave site in the Benakal forest;[3] that Bruce Foote visited the Doāb on a number of occasions in the succeeding decades and has left in his collections and publications much valuable information on the sites he discovered. The discovery of Maski was by Foote. In the period 1925–45 the two main contributors to our information were the Hyderabad Archaeological Department and the Geological Survey of Hyderabad. In the former the work of Khwaja Mohammed Ahmed is particularly noteworthy, culminating in the large-scale excavations at Maski, which still await exhaustive publication: in the latter the work of its remarkable Director, Captain Leonard Munn, whose unflagging enthusiasm led to the discovery of over forty new sites. The limitations of Munn's work may, however, be soon seen. In his paper on the Prehistoric and Protohistoric finds in the Raichur district[4] he attempted to bring together his evidence: the results do little if anything to carry forward Foote's observations and leave the reader more muddled at the end than at the beginning. One other thing made Raichur district remarkable. The discovery of a minor rock edict of Aśoka at Maski in 1914 by an engineer, Beadon, was followed by that of two more at Koppal some twenty years later.[5] Thus it appeared that the Raichur Doāb must have been included with the districts to its south in the southern province of the Mauryan empire, indeed Munn associated the name Suvarnagiri with Maski—the ancient settlement on the edge of the Raichur gold fields.

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[1] Foote, R. B.: 'Notes on some Neolithic and Palaeolithic finds in South India', *J.A.S.B.*, LVI, Pt. 2 (1887), pp. 259–82.

[2] *Ibid.: M.G.S.I.*, XXV (1895).

[3] Taylor, P. Meadows: 'Notices of cromlechs, cairns, etc., in the principality of Shorapur', *J.B.B.R.A.S.*, IV (1852).

[4] Munn, L.: *Man in India* (1935), pp. 225–50.

[5] Krishna Shastri, H.: *The New Aśokan Edict of Maski*, *H.A.S.*, 1 (1915); and Turner, Sir R. L.: *The Gavīmath and Pālkīguṇḍu Inscriptions of Aśoka*, *H.A.S.*, 10 (1937).

Armed with this information about the sites of the Raichur Doāb I came to India in 1951 to carry out a survey of the area. Mudgal, with its great fort, was one of the most renowned spots in medieval times and this led me to visit it. The fortress is second only to that of Raichur itself in size and grandeur. Munn had indicated the presence of two groups of prehistoric graves north of the town and I wished to visit them if I could find them.[1] The rocky waste land lying south of the fortress also attracted me, particularly because the Archaeological Department had reported finds of stone tools near the fort.[2] Finally, we noticed some graves near the 13/6 milestone and while inspecting them my wife pointed to an area some half mile farther westwards saying, 'That is a likely spot for a settlement'. Walking in that direction we were soon rewarded by the discovery of further graves and shortly after of a stone alignment. When we first entered the main settlement areas we were astonished by the wealth of antiquities, including Neolithic pottery and stone tools, lying on the surface, and by the undisturbed appearance of the site. After two more days of exploration it became clear that this was one of the largest and most promising Neolithic settlements we had so far seen: richer than Maski itself. It is perhaps of some interest to quote here from the general conclusion to our notes of this time as they reveal not only the *raison d'être* for further work but also the extent to which purposeful surface observation may indicate the history of a site: 'Piklihal appears to have been one of the three major Neolithic sites of Raichur district. In extent it can only have been rivalled by Maski and excavation might well reveal that it excelled even this. The terracing and platforms of the habitational areas may well be of this period. Pottery of Neolithic age seems to be more plentiful than at Maski. Similarly as an example of an Iron Age town it vies with Maski in completeness. Although it was probably smaller it was also far less disturbed by later settlements. The Andhra occupation seems to have been on a small scale and there are few traces of fine, imported wares. Perhaps Koppal, which seems to have developed only during Iron Age and early historic times, may have then eclipsed Piklihal' (Note of May, 1952).

The discovery of the Piklihal site took place at the end of our period of exploration in Raichur. Shortly after we returned to Hyderabad and reported our various finds to Dr. Srinivasachar, the Director of the Hyderabad Archaeological Department. He made a generous offer to carry out an excavation under my direction. The site at Piklihal was selected as being the most promising Neolithic settlement we had observed in the district, and on 5th June, 1952, less than one month after its discovery, the excavation started. Work continued for five weeks and was necessarily ended as we had already booked our return passages to England for the month of July. Thus it came about that the final study of the materials from the excavation was left unfinished; and it was not until our return to India in 1957 that we could complete it. Thus the report which is now presented includes two main bodies of evidence: the field notes and observations which we made in 1952 and which were embodied in systematic form in my Ph.D. thesis: 'The Development of Early Cultures in the Raichur District of Hyderabad' (London, 1954); and the analysis of the pottery and other materials from the excavation, dating mainly from 1957.

---

[1] Munn, L.: *J.H.G.S.*, II, Pt. 1 (1934).

[2] *A.R.H.A.D.* (1935-36), App. D.

ACKNOWLEDGMENTS

The first part of this work was done while I held a 'Scarborough' studentship from H.M. Treasury; the original summary was included in my Ph.D. thesis for London University in 1954, and the later study of materials was made while I was on study leave from the School of Oriental and African Studies, London. I am greatly indebted to Dr. P. Srinivasachar, the former Director of the Hyderabad Archaeological Department, whose generous support made this excavation possible; also to former members of that Department and to members of the Andhra Pradesh Archaeological Department, to Syed Yusuf who organized the entire administrative side; to Syed Ahmed for help at all stages both in the field and in Hyderabad; to Aminuddin whose technical assistance and knowledge were invaluable; and to many others. I must also thank a number of other specialists: Dr. P. Srinivasan of Osmania University for his study of the animal remains; Professor Ananthanarayana Ayer of Madras University for his study of the human remains; Mrs. Van der Feen of the Zoolögisch Museum of Amsterdam for examining the snail specimens; Mrs. M. Smith of the British Museum (Natural History) for the serological study; Mrs. Hope-Simpson and Miss I. Geddye of the Institute of Archaeology, London University, for the reconstruction of the legged stand (Pl. 34); and many other colleagues both of London University and elsewhere who have helped me in various ways, particularly Miss D. M. Johnson of S.O.A.S. for great help in overcoming problems arising in the proofs. Finally, I must take this opportunity of expressing my very deep debt of gratitude to my wife, Dr. Bridget Allchin, who from first discovery of the site to completion of the report has worked with me at every stage.

TERMINOLOGY

In this work certain terms are used in a way which differs from that current in much archaeological writing. For this reason we shall indicate our usage of these words. The archaeologist often uses 'culture' in a peculiar way which is quite different from its principal use in the sister science of anthropology. An even more peculiar fate has overtaken the word 'industry' at the hands of the archaeologist. The term 'culture' in its modern technical sense was skilfully defined by Tylor and, by and large, modern anthropological usage derives therefrom.[1] For the archaeologist, particularly in the study of pre-literate societies, the term 'material culture' may appear as a convenience; but this must not mask the aim of our study which should be to reconstruct, as far as possible, knowledge of the whole life of the members of a past society. The usage to which we are objecting is that which defines the culture in terms of assemblages of objects, *qua* objects, and not as things fit for interpretation, and therefore potential culture traits. Thus, the word culture should not relate only to the descriptive level ('Corded-ware culture', 'Battle axe culture', etc.) but to the interpretative; we shall define it, in near-Tylorian words, as ideally the sum total, but practically the maximum available at the time of study, of the physical and mental activities of, and objects acquired or produced by, the members of a given society during a given period of time. The cultures of the archaeologist are thus reconstructions of information about these activities and as such are always to be expressed as interpretative hypotheses based upon the evidence supplied by archaeological research techniques.

---

[1] Tylor's classic definition is to be found in the opening words of *Primitive Culture* (1871), p.1. The history of the anthropologist's use of the word has been described in great detail in *Culture* by Kroeber, A. L., and Kluckhohn, C. (Cambridge, Mass., 1952).

Our use of 'industry' attempts to rehabilitate the archaeological term by making it conform to the modern common usage. In archaeology it is frequently linked with 'culture' and becomes a simple descriptive term used for the objects of a given assemblage.[1] Once again, for us industry is on the interpretative level and thus we define it in terms of the objects, not *qua* objects but as the products of human labour. Thus an assemblage of artifacts from a given area and interval of time which appear to be the products of systematic work or labour and which show by their technological features that they are products of a single craft tradition are referred to as the products of a given industry.

Finally, we may note certain terms relating to that class of monuments usually called 'Megalithic'. This word carries with it such overtones and associations with theories of Diffusionism, etc., that we shall use it only rarely and then chiefly to describe large stone monuments. Its use as an epithet to describe pottery, an archaeological culture, a civilization (!), etc., and even more remotely the people who built the graves, is at best unhappy. Thus what is sometimes called the Megalithic culture we follow Foote in naming South Indian Iron Age; the red-and-black pottery we follow current usage in describing as red-and-black (B1) ware; the graves we shall ascribe to the Southern Grave or Burial complex. The Celtic words menhir, dolmen, cistven, etc., we shall not use preferring simple descriptive terms, standing stone, stone cist, etc.; nor shall we talk of menhir avenues, but rather of stone alignments, as this better describes the monuments of the Deccan.

We shall throughout use certain terms in describing the ware or fabric of the pottery from Piklihal; these terms are primarily descriptive and are based upon a technological study to be given below in Part II. They do, however, also have a general sequential significance. We list them here so that they may not cause confusion when they appear. Studied in the mass the pottery remains indicate the presence of a number of distinct industrial traditions; each of these is given a separate distinguishing letter, A, AB, B, C and D. The varieties within one of these ware groups may be further divided, on the basis of techniques, by the addition of a number,. A1, A2, etc., and sometimes of certain descriptive terms, such as A3 red, A1 surface roughened (rusticated), red-and-black B1, etc.

---

[1] Our use of assemblage thus follows Braidwood, R. J.: *Prehistoric Men*, p. 78 (1948), but our use of industry, on the interpretative level rather than descriptive, departs from that author's, *loc. cit.*, p. 49.

Ware	Culture Sequence	Varieties	Short Description
A1	Lower-Upper Neolithic	Grey, black, buff	Hand-made, without burnish
,,	,, ,,	Incised	,, ,, ,,
,,	,, ,,	Perforated	,, ,, ,,
,,	Upper Neolithic	Surface roughened, rusticated	
A2	Lower-Upper Neolithic	Grey, black, buff	Hand-made, burnished
,,	,, ,,	Ochre painted	A post-firing wash of red ochre has been applied
A3	Mainly Lower Neolithic	Red, black, chocolate, brown ochre	These colours are those of the distinctive dressing applied to the ware, hand-made
,,	,, ,,	Painted	With purple ochre paint, applied before firing
A4	Upper Neolithic	Grey, buff, mottled	Burnished, often turn-table made, surface-fused
A5	,, ,,	Grey, buff, olive green and black	Burnished, often turn-table made, approaching red-and-black ware
AB	Intrusion	Painted	Buff or red slipped, wheel-thrown unburnished ware with purple ochre paint
B1	Iron Age	Red-and-black, red, black	Burnished, often turn-table built, sometimes wheel-thrown, 'Megalithic' ware
B2	Early historic	Red-and-black	White clay pigment under russet dressing, 'Andhra painted'
B3	Iron Age	Red, black	Wheel-thrown, unburnished
	Early historic	Red-and-black	
	Early medieval		
,,	Early historic	Rouletted imitations	
B4	Early historic-Early medieval	Red	Without slip or burnish, wheel-thrown
C1	Early historic	Rouletted ware	
C2	,, ,,	Red gloss	Red polished ware
D1	Medieval-modern	Black, grey, buff, brown	Unburnished, wheel-thrown, made by existing traditions

THE CULTURE SEQUENCE

We shall now anticipate the conclusion (Part III) so as to indicate the culture sequence revealed at the site. Here we are concerned mainly with the names given to the various periods and the principal classes of object and monument associated with each.

Lower Neolithic.—The earliest settlement revealed belongs to the Lower Neolithic period. The term Neolithic was adopted for two main reasons: that historically this is the term applied by Foote, who first identified this culture in the region, and that culturally speaking it conforms with cultures known as Neolithic in many parts of the Old World. At Piklihal the period seems to have been distinguished by a special type of settlement and by the presence of pottery of A1, A2 and A3 wares. The legged stands of A3 red, together with the terracotta figurines of bulls of the same ware, are characteristic. Associated with the pottery is a typical Neolithic ground stone industry and a typical Neolithic blade industry. The presence of large numbers of cattle is further indicated by the bones recovered from the period.

Upper Neolithic.—This late Neolithic culture is distinguished from the lower by the disappearance of the A3 wares and by the increased frequency of the A4 and A5 wares. It is not yet clear whether these represent more than a local evolution from the earlier period. The evidence shows a development of the house types, and the first certain occurrence of fragments of copper and bronze. These, however, are present in such small quantities and are so much overshadowed by the continuing stone industries that to call the period Chalcolithic seems culturally unwarranted.

Intrusion.—There is, at Piklihal, very slender evidence which permits us to postulate that the end of the Neolithic period and the beginning of the Iron Age is associated with an intrusion from the North. The evidence rests upon the presence in the sections of a very small number of sherds of wheel-thrown (AB) painted ware, comparable to ware from Brahmagiri and also closely related to certain pottery from Maharashtra. This intrusion, it can be inferred, was associated with a Chalcolithic or even Bronze Age people; but the evidence at present available does not permit of certainty.

Iron Age.—This period corresponds to the Megalithic culture of Brahmagiri, but Foote's Iron Age has been preferred for reasons already mentioned. The settlement pattern seems to have continued unchanged from the late Neolithic, although the innovation introduced by the intruders, of burying away from the settlement area, was maintained. The characteristic pottery of the period is red-and-black B1 ware but the pottery of the late Neolithic continued in use. The first objects of iron occur.

Early historic.—This corresponds with the Andhra period of Brahmagiri. At Piklihal it is characterized by a change in the settlement pattern, and apparently a shrinking of the size and importance of the site. The pottery which dominates is the red, black, or red-and-black B3 ware but the russet-coated, painted B2 is a regular occurrence. There is little evidence at Piklihal of continued occupation in any of the excavated areas and parts of the site may well have been abandoned during or at the end of this period.

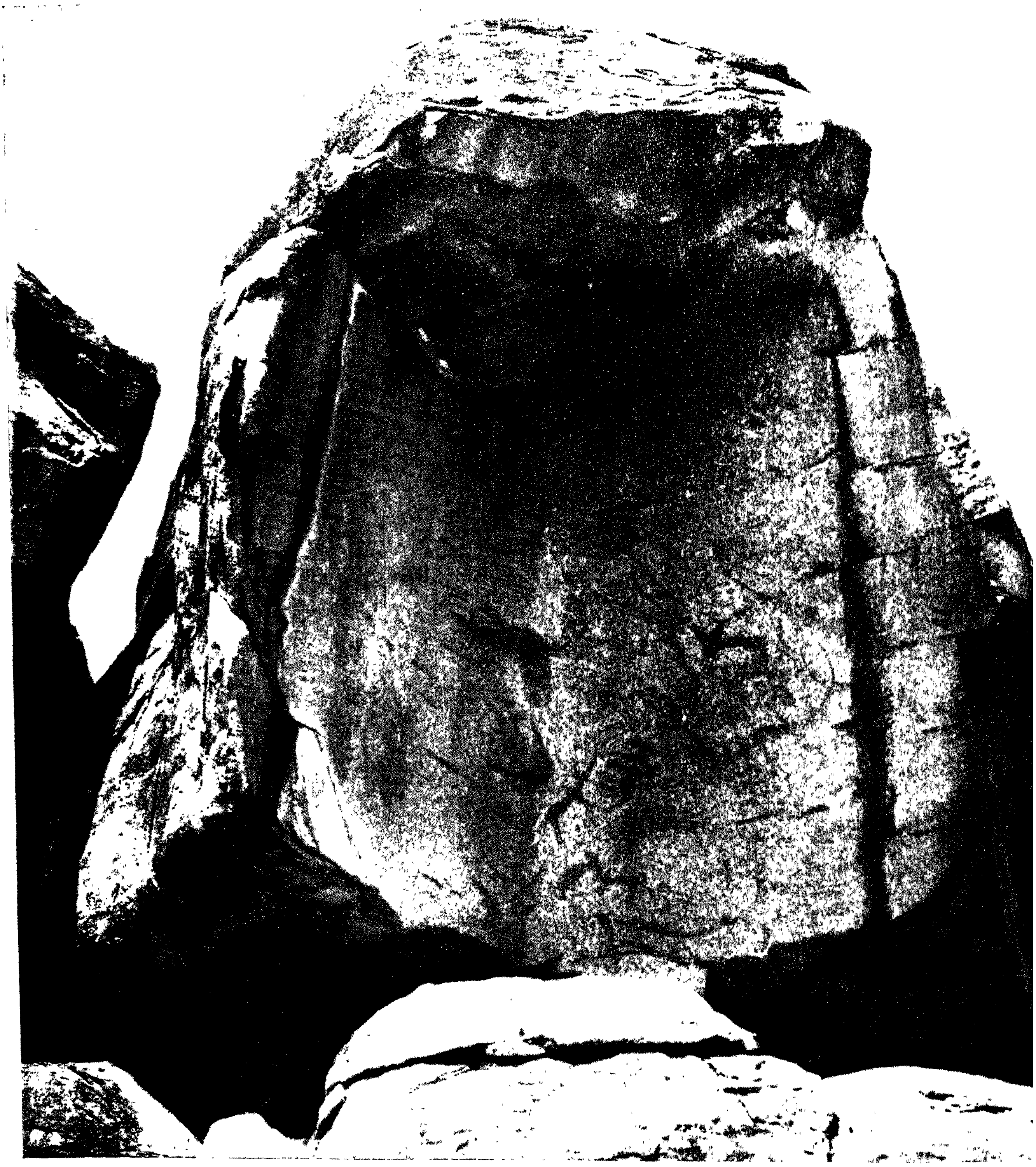
Early medieval.—There is no evidence of the occupation of any part of the site at this time, but pottery assignable to it occurred in several areas, and must indicate the presence of a settlement in the locality.

Medieval.—A small part of the site was fortified and occupation continued for a considerable time. The pottery characteristic of this period is the buff and grey D ware. There are indications of intensive iron smelting activity.

The only indication of date available is from coins probably of the Vijayanagar kingdom. No clear evidence is available for either the beginning of this occupation or the abandonment of the settlement.

PLAN OF REPORT

This report is divided into three parts, which correspond with three main processes of research. The plan is rational, if unusual, in that a large portion (Part II) rehabilitates from appendices matter which plays a vital part in arriving at the conclusions contained in Part III. Thus Part I deals with all types of field observation, including topographical observations, explorations and excavations. Part II is concerned with the subsequent analysis of objects discovered and includes objective comparisons. Finally, Part III draws together the evidence of the earlier parts and attempts to reconstruct the chief features of the cultures revealed, to make cultural comparisons and to arrive at comparative datings. Those whose interest lies primarily in the cultural conclusions may thus omit the first two parts, although both contain much cultural information of a more technical nature.



Rock painted bulls

PART I

FIELD OBSERVATIONS

GEOGRAPHICAL

Mudgal fort and the neighbouring Piklihal lie in the western part of the Raichur Doāb in an area dotted with ancient sites and ancient gold workings. From the high ground to the north of the town one may observe the Mudgal hills immediately to the south; turning to the north, just visible above the spur, is the top of the Billamrayan Gudda hill, known from Foote and Munn to be an important Neolithic settlement, lying some eight miles away; and to the south-east, at a distance of about fifteen miles, may be seen the Maski hill with its Aśokan edict and ancient settlement. To the north and west lies the Krishna river, flowing eastwards across the plateau towards its meeting with the Tungabhadra and the Bay of Bengal. At its nearest point the river is some four hundred feet below the Mudgal hills and the broken escarpment of its valley is perhaps in part responsible for the pleasant climate enjoyed there. Mudgal and Lingsugur thus straddle a spur of higher ground which falls away to both the north-west and south-east.

Geologically the rocks of the Mudgal area belong to the Peninsular granites, but both to the east and south-west there are bands of Dharwar schists: those to the east are famous for their gold-bearing quartz and are the site of the many ancient workings which lie between Maski and Hutti.[1] Those to the south-west contain bands of ferruginous quartzite and were certainly exploited in medieval times. The alternation of the granites and schists is one of the factors which determines the soil and topography of the area, and accounts for the dramatic alternation of landscape. The other principal factor here is the rainfall. This averages only from 20″ to 25″ *per annum* and thus gives rise to a dry thorn forest or rather scrub. In the Dharwar areas there is an alternation of bare rocky ridges and expanses of black cotton soil; but the nature of the rock makes tank irrigation impossible and so even these present a generally desolate appearance, yielding only poor crops of millet or cotton. In the granite areas the possibility of irrigation and the alternation of black and red soils makes possible more profitable cultivation and permits the maintenance of a wider range of deciduous trees. It is probable that observation would record lower day temperatures in the granite areas than the schist.

Mudgal lies upon an ancient route from Maharashtra to the south. This route passes Shahpur in the Gulbarga district, famous since Meadows Taylor's time for its great Megalithic 'tumulus' and other remains: it reaches the Krishna south of Tathni where an ancient settlement guarded the river crossing. Climbing the long hill from Tathni one reaches the medieval *samasthān* of Gurgunta and proceeds south-westwards towards Lingsugur. On the north-west the land falls away to the river across stony soil and expanses of scrub. In this thinly populated region lies Amareśwar, around whose perennial spring an ancient cattle fair is held. To the south-east the schists and their black cotton soil covering open out and Hutti appears as an island of white huts in a barren sea of black soil. Finally, the road descends slightly to the pleasant Lingsugur cantonment; Billamrayan Gudda is seen on the right of the road and Pelipenta hill, a conical dome of red syenite, crowned with a temple but guarding a microlithic site, looms up across the great tank. Beneath the waters of the tank and extending for several miles on either side are scattered graves, evidence of an anciently extensive population; while beyond Pelipenta is the great basalt dyke which provided the raw material for the Billamrayan Gudda axe factory. At Lingsugur the road forks, the eastern branch turning away towards Maski and Bellary, the western towards Mudgal and Koppal. This road climbs the low spur and soon the Mudgal hills appear ahead. Around Mudgal there is a fertile red soil and plentiful irrigation works, preserved since the days of its greatness, maintain many large trees, including groves of mangoes.

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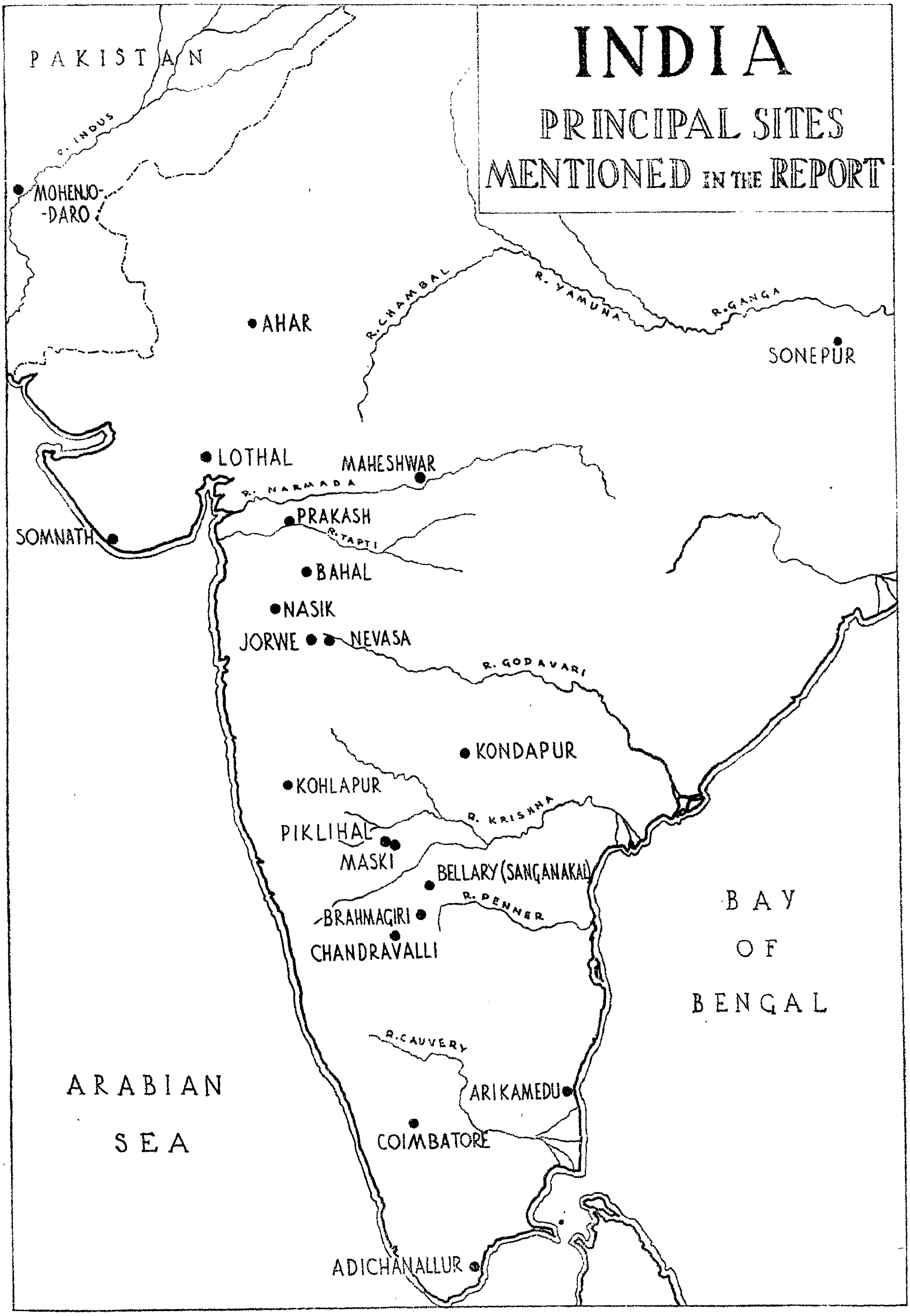
[1] The geology of Raichur is described in the *J.H.G.S.*, Vols. II and III (1934–36). I shall have more to say about Hutti in a later volume.

Mudgal fort lies on the northern edge of a rocky area, at a place chosen no doubt for strategic reasons. The medieval town and its modern extensions nestle around the fortress. South of the fort is a broken rocky waste, dotted with hillocks of granite, extending several miles to the east and west: south again the road emerges after two miles into an open plain draining towards the south-east. Piklihal site lies on the southern border of this rocky waste (Pl. 6). It is situated among a cluster of about a dozen granite hillocks islanded from the central waste by areas of cultivation. In Pl. 5 the site is viewed from the east, the modern road from Lingsugur passes in the foreground, while the site itself is in the central distance. Mudgal fort lies beyond the right-hand limits of the view. The characteristic features of the site are the terraced fields between the bare hills (Pl. 7). They are still maintained and cultivated; and the evidence points to their great antiquity. Around the site the *nīm* and mango flourish as cultivated trees, as does a variety of the *ficus*, but the natural vegetation includes *acacias* and *euphorbias*.

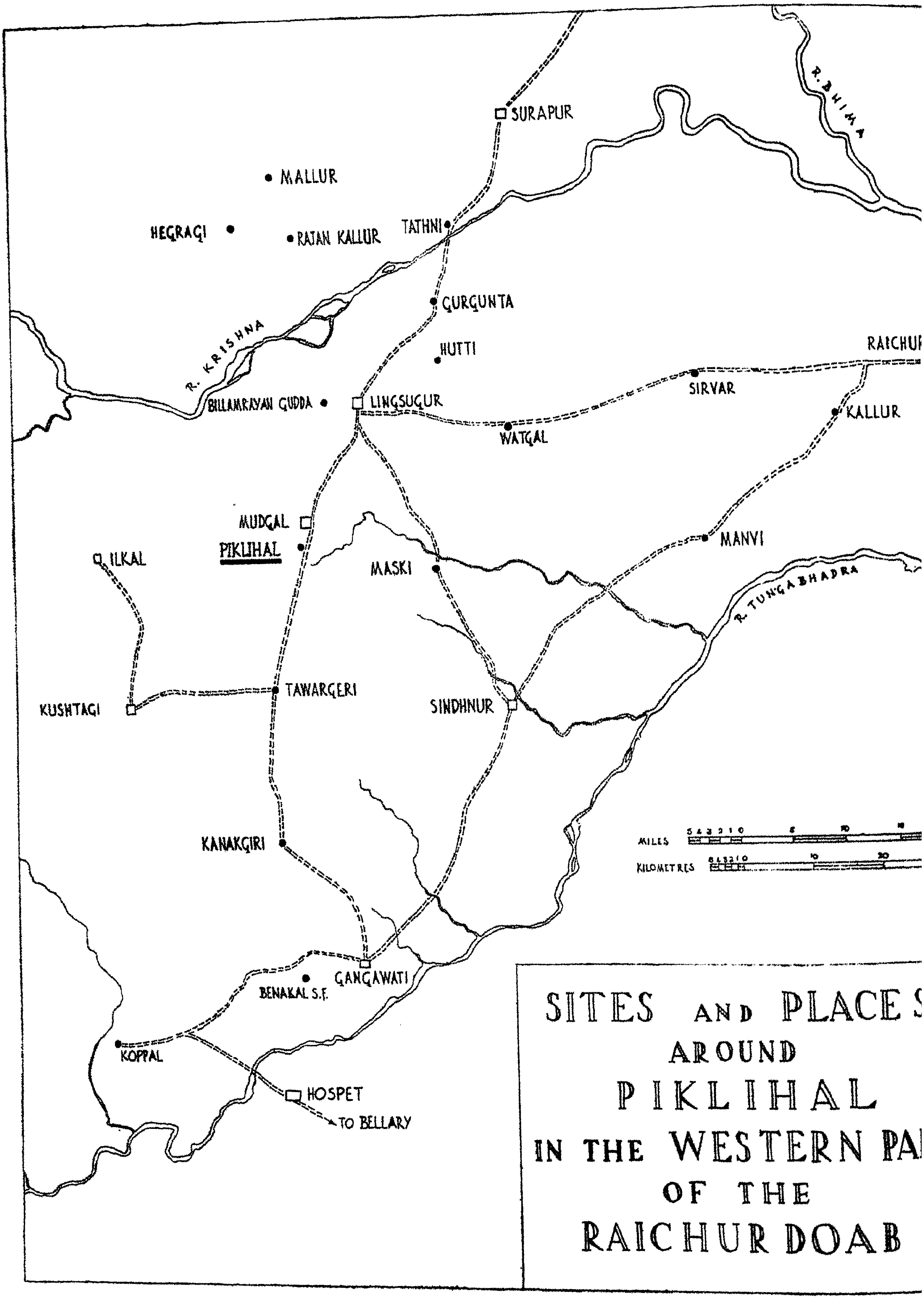
Some five miles further south the road enters the Kushtagi Dharwar band and there is a dramatic change in the country-side. The plain gives way to a series of bare hills containing the ferruginous quartz bands and giving rise to a very poor sandy soil. Cultivation all but ceases on the boundary of this zone and the natural vegetable covering survives to this day, a thin *acacia* scrub and dry grass land. If, as one may infer, this is virgin ground then it must anciently have been of far greater extent than today and have been sufficient to nourish a plentiful supply of game.

The ancient site which we shall call Piklihal lies about two and a half miles south of Mudgal fort. The village of Piklihal itself is another mile to the south, on the right of the road. It contains no structures of note, and can be safely assigned to recent centuries, both from the absence of any traces of antiquities around it and from its siting.



Map: sites mentioned in the text

PLAT



Map : sites in the Raichur Doāb

MUDGAL AND ITS FORT: HISTORICAL NOTE

In the turmoil and wars of the Muslim invasions Raichur Doāb, and in particular the great forts of Raichur and Mudgal, find frequent reference. They lay for long in a 'no-man's-land' between the Vijayanagara kingdom and the Muslim kingdoms of the Deccan. Before this the history becomes less complete, and has largely still to be written. The antiquity of the name Mudgal is certain but early references are not easy to precise. However, that of Ptolemy in his geography is quite convincing, and fits well the picture archaeology reveals. Ptolemy refers to towns of Ariake (? the political sphere of the Andhras in the Deccan) in one of those passages which perhaps enumerate the halts along a route. The series includes Sirimalaga, Kalligeris, Modogoulla, Petirgala and Banaoasei.[1] Of these the first, which may represent an original Śri-mangala, I cannot identify; the second, probably some Kāligiri or Kṛṣṇagiri, is also uncertain but may be Kalkeri in Bijapur district; the third is surely Mudgal; the fourth has been identified with Pattadkal;[2] while the last name is beyond doubt Banavāsi. Thus Mudgal finds itself linked with Banavāsi and Pattadkal. It seems also probable that, in the absence of any remains identifiable with the early historic period at Mudgal fort and town, the site of Piklihal, nearby, represents the main settlement of Mudgal at that date. The firmer history of Mudgal does not begin for several centuries, and it probably dates from the time of the first construction of the fort. Although Mudgal lies little more than 50 miles east of Badami, and in the heart of the early Chalukyan kingdom, no inscriptions of that time have been found there; nor are there inscriptions of the later Chalukyas, although these occur at Maski and at Karadkal to the north.[3] Throughout the medieval period the Raichur Doāb must have been repeatedly the scene of military campaigns and it is quite possible that so easily defended a place as Mudgal may have possessed a fort even before the Yadavas built one, probably as a bastion of their southern frontier. There are at Mudgal several Yadava inscriptions, as yet unpublished, and these appear to coincide with the main building of the early period there. Another copperplate inscription from Mallisetti in the Belgaum district refers to an *amātya* of the Yadavas residing at Mudugala in the year A.D. 1249 (Śaka 1171).[4] In A.D. 1312 the city was attacked by Malik Kafur and the long history of the struggle of the Muslims and the Vijayanagara dynasty, in which Mudgal plays no small part, begins. In the early inscriptions the name is usually written Mudugala, reminiscent of the form Ptolemy gave it. The main structural features of the fort have been described by Yazdani in his 'Note on a Survey of the Mudgal Fort'.[5]

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[1] McCrindle, J. W.: *Ancient India as described by Ptolemy* (1885), p. 179.

[2] Panchamukhi, R. S.: *Archaeology of the Karnatak* (1953), p. 50.

[3] The Karadkal inscription of Trailokyamalla Chalukya, dating from Śaka 974 (A.D. 1052), is as far as I know unpublished. It was photographed by me in 1957 in the compound of a house of the Hatti Gold Mine, whither no doubt it was removed during the last century. I am indebted to my friend and colleague Dr. Duncan Derrett for reading it for me.

[4] *See* Gazetteer of the Bombay Presidency, Vol. I, pt. ii, Bombay (1896); pp. 527–33 and p. 245.

[5] *A.R.H.A.D.* (1935-36), Appendix C, pp. 25–27.

EXPLORATIONS IN THE FORT AREA

We may add to the historical account of Mudgal fort a brief notice of archaeological observations in its vicinity. Although these were neither systematic nor exhaustive they are strikingly consistent: they were made while moving about in the town, particularly within the perimeter of the fort, on several different occasions and are supported by the reports of local inhabitants and archaeological caretakers. Much of the area enclosed is now uninhabited but it yields copious traces of occupation. Ruined house walls can be seen in many places and among them are pits where recent earth-digging operations have taken place. Several of these appeared to have reached natural soil but without some systematic excavation this is uncertain. The most common remains are potsherds in grey or brown DI ware, dating from the past five centuries, but in some areas older remains can be seen. In particular in the neighbourhood of the old magazine (*bārūd khānā*) there is a fair sprinkling of earlier pottery. Nothing that I have seen there need be as old as the Satavahana period, although excavation might prove otherwise, but much dates from the early medieval. Pottery of the fourth–eleventh centuries has been found at a number of sites in the Raichur Doāb: it is predominantly red but black and chocolate also occurs. We shall be describing it in greater detail in a later volume. Here we may conclude that settlement in the fort area certainly goes back to the seventh or eighth century but that there is as yet no proof of any earlier occupation. The hills behind the fort contain some caves, but no rock paintings or bruisings are reported, nor did I notice any stone artifacts, although these had been reported earlier there.[1]

DESCRIPTION OF THE PIKLIHAL SITE

FORTIFICATIONS

We now turn to the site itself and the traces of antiquity which can be observed there. To the west of the group of hillocks a cart track approaches Mudgal from the south from the village of Wyākarnhāl on the Maski nulla some four miles away. It is probable that this is an ancient variant of the main Kushtagi route which passes about a mile further to the west (Pl. 6). Running for two furlongs in a north-westerly direction across the cultivated ground which joins Piklihal to the rocky waste is what appears to have been a stone defensive wall of considerable strength, faced with roughly trimmed blocks and filled with rubble. Where the track meets this wall are to be seen the ruined foundations of a considerable bastioned gateway. About one hundred yards south of the gate is a stone platform with typical Hanumān image. The age of this wall was not determined but it probably relates to medieval Mudgal rather than to Piklihal.

In the south-east of the site, *Area C* (Pl. 6) appears to have been fortified by dry stone walls to its east and west. This fortification is typically medieval and may certainly be associated with the settlement it surrounds. Similar fortified villages were observed at many other places in the Raichur Doāb.

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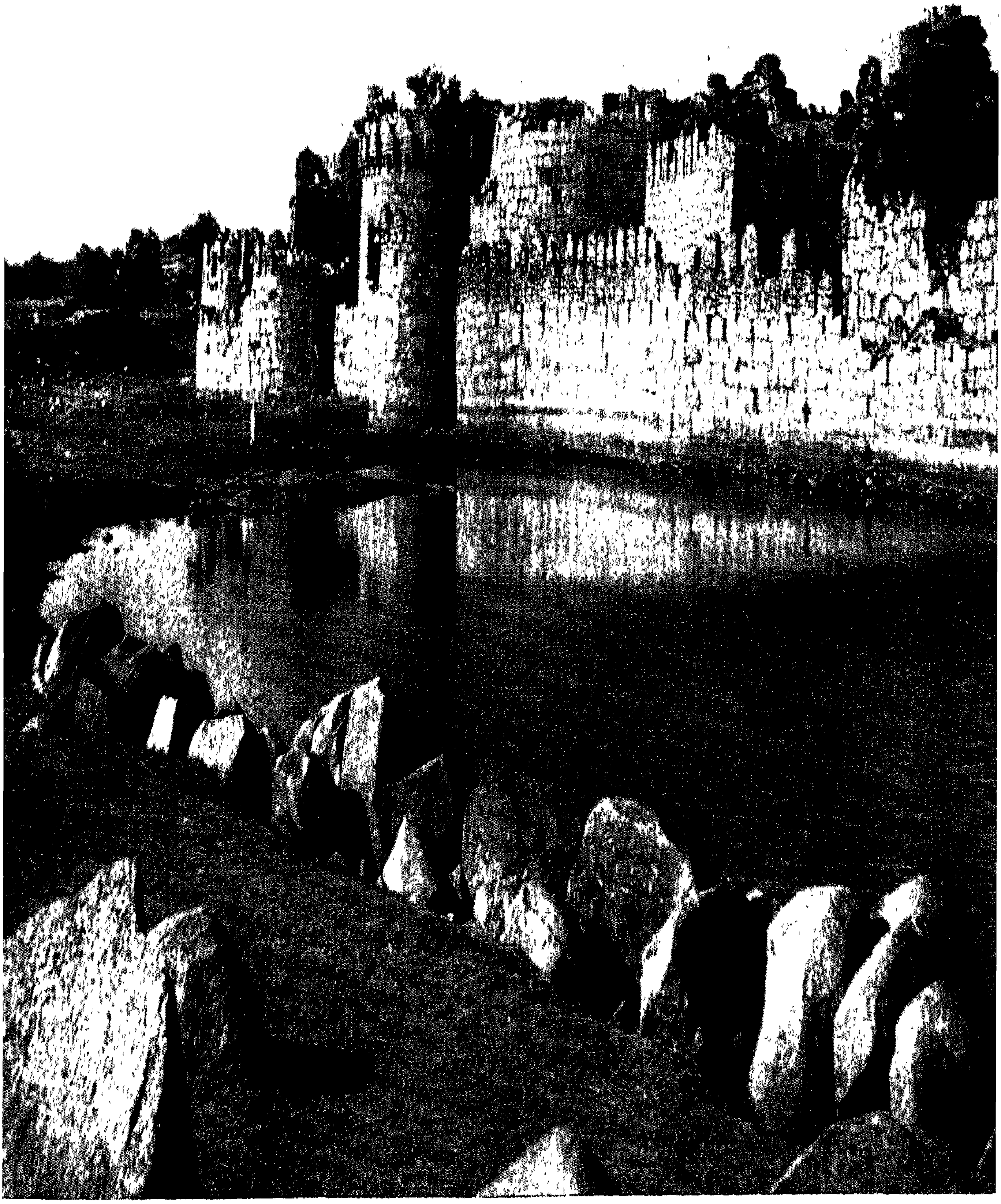
[1] *A.R.H.A.D.* (1935-36), Appendix C, pp. 25–27.



Mudgal fort : view

PLATE 5

Piklihal from the east

SETTLEMENTS

Area C is divided from Area B by a ridge of granite. Within the limits of the stone fortifications are ruined foundations of stone walls of houses typical of the medieval period. I did not discover any local tradition which recalled the date when this village was abandoned. The area was scattered with occupation debris typical of the medieval period, including D ware, potsherds, glass bangles and beads. Some of the foundations were built out in front of natural caverns in the rocks, but none of the caverns appeared to contain any undisturbed deposits. Mingled with the medieval debris were other pottery and remains which belong to the early medieval and early historic periods, and even some which can be assigned to the Neolithic. Thus it is probable that careful and more extensive digging would reveal in this area evidence of continuity of occupation through these periods up to the time when the site was abandoned. However, surface observation suggested that most of the deposits had been disturbed. A small, unfinished, trial trench (Site V) was made at the north-eastern end of the area.

Area J, associated caves and tank.—On a level plateau on the hill J (Pl. 6) there are traces of a somewhat similar settlement, although apparently of a less permanent nature. The plateau is approached by a broad ascent or ramp on the rocky hill-side, probably made by clearing large boulders to facilitate the passage of cattle. When visited the plateau was grass covered and yielded few finds, but pottery discovered there included, besides the medieval D wares, B2 painted and B3 ware: thus it appears that the settlement relates to the early historic period. Several of the platforms have been built out in front of natural caverns, as in Area C. To the north two groups of caves are worthy of notice: capping an adjoining hillock is a series of large natural caverns, in one of which is a round artificial basin about 10 feet wide and 4 feet deep. Outside is a small temple partly built of stone and partly natural containing a Bhairava image, probably of the fifteenth century. This whole group of caves has traces of modern occupation, probably by *sādhus*, or of camping at the time of festivals. Immediately below is a stone bund and surface drainage tank. The second group of caves is contiguous with the north-western side of Area J: a series of partly natural rock stairways rise from terrace to terrace until the great boulders above are reached with their small natural caverns, forming a little, airy solitude reminiscent of the Pālkīguṇḍu rocks at Koppal, but here with no trace of inscription. Below a cliff of about 20 feet there is a broad terrace, some 16 feet in width with a stone retaining wall of 4 feet in height. Behind this terrace is a great natural cave of apsidal plan, some 24 feet long, 14 feet wide and 10 feet high. No antiquities were discovered in association with this group.

Area K.—Before we return to the central site and the most important settlement areas one more outlier demands notice. About one furlong west of Area J a broad valley leads through to Mudgal fort. In this valley a deep rain gully had cut through a considerable deposit of B1, B2 painted and B3 wares. They probably derive from the foot of the hill to the west where there are still traces of much eroded terraces. To the east, along the southern foot of another hill there are further traces of deposits. All these appear to indicate some slight extension of settlement in early historic times into this area.

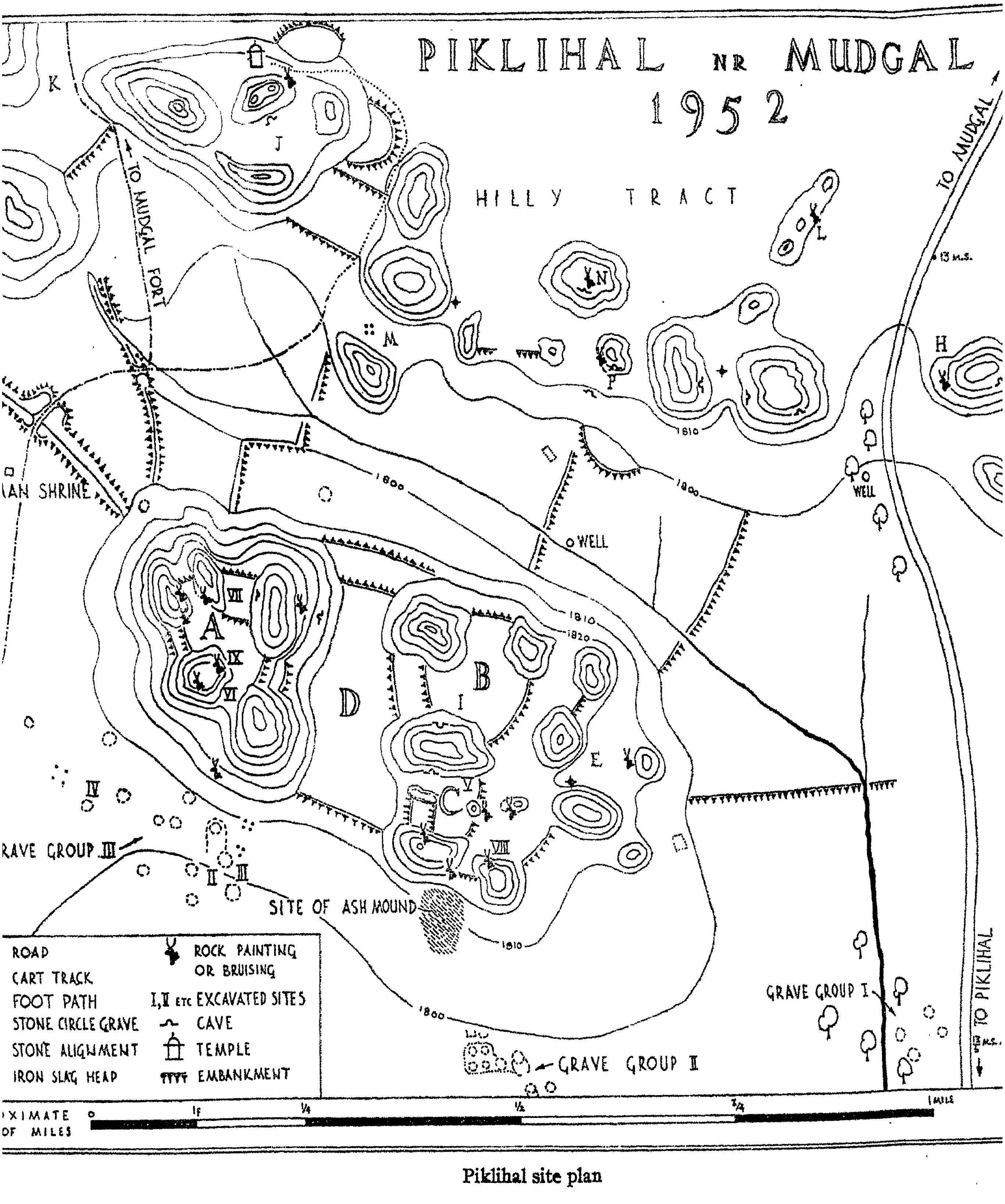
Area A.—We now reach the central block of hills, and crossing the low terrace D, to which we must return later, climb a rocky way, past a number of small terraces to Area A. This small terraced field lies between 30 and 40 feet above the plain. Leading off the central 'corridor' are a number of smaller terraces: that to the north-east was excavated as Site VII (Pl. 14), that to the south-east as Site VI, and that to the north-west was not excavated. Site VII is thus a little field enclosed on two sides by rocks, abutting on the south a slightly larger terraced field and on the north a steep slope down about 50 feet of rocks to the plain. A further small cutting was made in the central corridor (Site IX). These terraces were littered with pottery of all kinds of A ware and B ware as well as with basalt flakes, broken axes, rubbing stones and microlithic blades. They were identified as one of the principal areas of Neolithic and later settlement. On the rocks above, at several places, tiny pockets of soil, fragments of pottery and ground stone tools were encountered which testified to the originally greater extent of settlement at a still higher level.

Area D.—Descending again to Area D we may notice that it is also at present under cultivation, but almost devoid of antiquities. It may be that there was anciently no settlement here or on the other hand that it lies too deeply buried to be revealed without excavation. Whatever the reason, we were unable to make any trial trenches in the area. At least one large cave overlooks it from the west, but it was quite scoured of whatever deposits it may originally have contained.

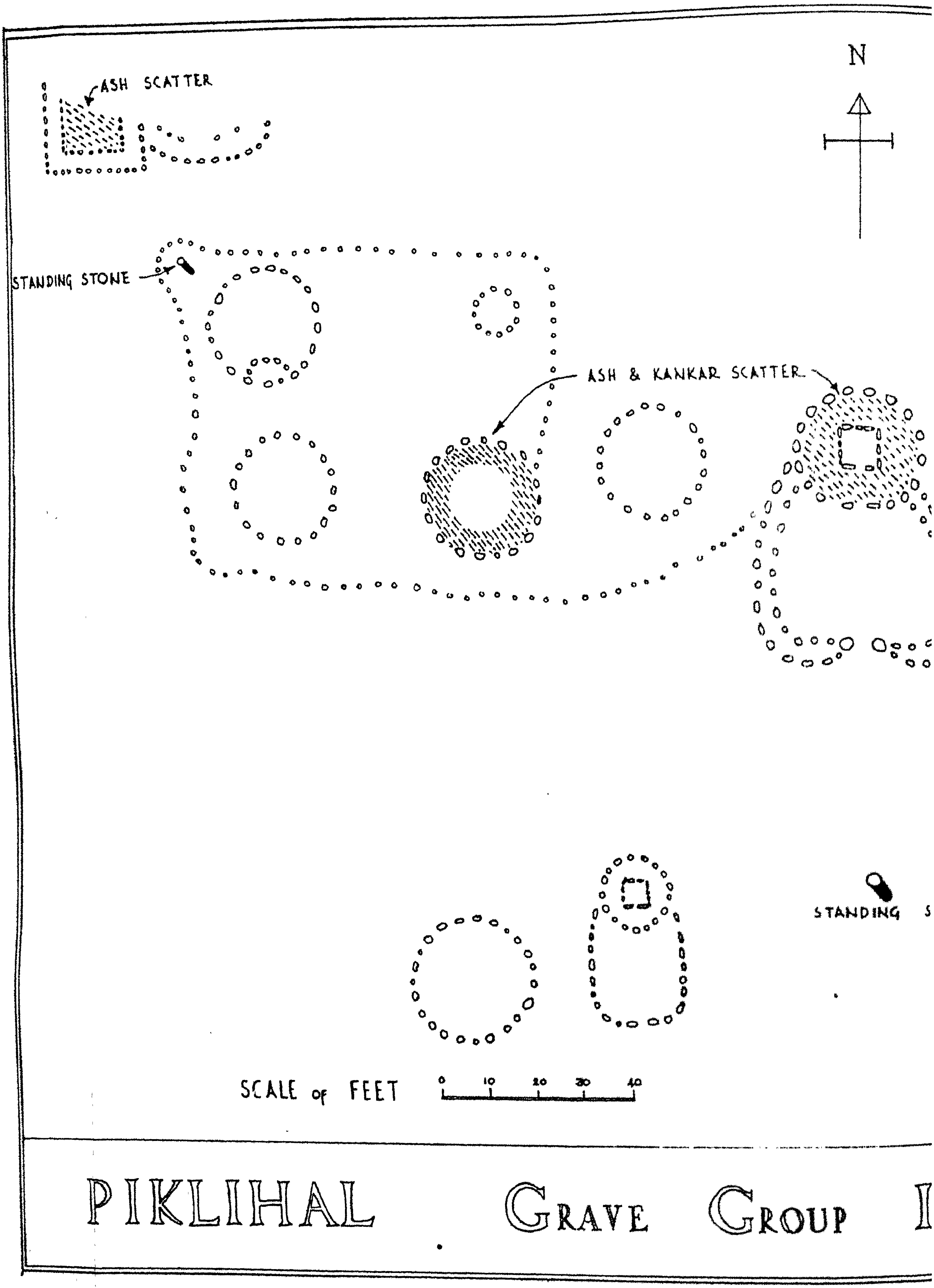
Area B.—Moving eastwards we enter a still more expansive group of terrace fields (Pl. 7*b*), which again contained plentiful debris of Neolithic and later occupation and evidently some of the deepest deposits in the whole site. Here a trial trench (Site I) was excavated on the southern side. South-east of Area C is another small terrace which produced Neolithic and later fragments; excavation was also undertaken here (Site VIII). To the east again there are today a series of little fields at lower levels among the remaining hills. Here the traces of occupation almost entirely disappear and no excavation was made.

GRAVE SITES

I. To the west of the Lingsugur-Gangavati road near the 13/6 milestone lie the graves which, as we have noticed above, were the first monuments to claim our attention at Piklihal. That nearest the road is the largest of the group: it consists of a near-circle of granite boulders about 40 feet in diameter, inside is a second circle of 32 feet, within which are a cairn of small stones in the north-eastern quadrant and, in the western, a second cairn which is in use as a shrine. The outer circles tend towards squareness. Three other cairn circles of 20 to 25 feet in diameter were noticed. All these graves lie in a thicket on the edge of cultivated land (Pl. 6).



Piklihal site plan



Plan of grave group II

II. About 600 yards west of the first group is a second, larger, one. There are the remains of eight certain graves and traces of several others (Pl. 8*a*). The largest grave is a circle of about thirty feet in diameter, composed of rectanguloid boulders of grey granite, 6 to 12 inches in thickness, laid around the circumference: there is an entrance on the south side. Within the circle is a shallow cairn of smaller stones covered with a scatter of lumps of scoriaceous cinder, deriving no doubt from the nearby ash mound to be described below. In the centre is a square cist with walls composed of granite blocks slightly larger than those of the circle, measuring 8 feet on each side. The cist, too, has a southern entrance. Adjoining the south side of the circle is an oval entrance court, 31 by 21 feet, made up of two lines of somewhat smaller boulders, again with a southern entrance. About 40 feet further south is a small standing stone of 3 feet in height, apparently aligned on the grave. West of this stone is a similar, though slightly smaller, grave with southern entrance court. From the west side of the first grave a line of small boulders runs away to the west forming a rectanguloid enclosure, of about 100 by 80 feet, within which there are five other graves. In the north-west corner this boundary line makes a sudden detour around a standing stone, now fallen, of about 4 feet in height. Of the enclosed circles, one has a scatter of 'ash', one a small oval division marked off, while the smallest is only 8 feet 6 inches in diameter. The remaining graves are circles of 20 to 25 feet in diameter. To the north-east of this group there are traces of two other graves; one appears to have been a square marked out by two lines of small stones and containing a scatter of 'ash', the other may have been similar or perhaps it formed an entrance court. The northern sides of both these monuments have been eaten away by ploughing.

III. About half a mile west-north-west of group II is a further group of graves lying along the south-western slopes of the central hills. These are in close association with two stone alignments, but the whole area is under cultivation and has been very much disturbed. It was here that some superficial excavation was carried out, to be described below (Sites II and III). In 1952 there were more than twenty graves still identifiable. The majority were simple circles of boulders varying from 16 to 25 feet in diameter. The largest grave, built in close association with the eastern alignment, is of some interest (Pl. 8*b*). It consists of an outer line of stones of apsidal form, 57 feet wide and 70 feet long, the long axis being on the southern alignment. In the apsidal end is a stone circle of 18 feet diameter with a central cairn, perhaps covering a second smaller circle and central cist as in the large grave of group II. Along the foot of the hills from this point westwards, and thence round to the northern slopes there are traces of other graves, now all more or less disturbed.

STONE ALIGNMENTS

There are remains of three stone alignments. All of them were already much disturbed when the site was first visited in 1952 and when I again saw them in 1957-58 the work of destruction had gone ahead at a saddening rate. As all three are fragmentary and as they can scarcely be understood except in the context of more complete specimens the reader is referred to my paper on the 'Stone Alignments of Southern Hyderabad',[1] where they are briefly described. Here, to make them more understandable I may summarize the features which distinguish the complete specimens.

Ideally the alignments consist of parallel rows of standing stones set out with mathematical precision and approximately oriented to the cardinal points. The stones are set at carefully regulated intervals which may differ on the north-south and east-west axes. The most common height of the stones is from 3 to 6 feet. There are two main varieties of alignment; the 'square' and the 'diagonal'. In the former variety, which includes many of the numerically smaller examples, the stones are set out in lines to form rectangles: the numbers of stones in such rows vary from three by three, four by four, to seven by seven. In the 'diagonal' variety the stones of the even-numbered rows are offset by half an interval, or rather are set in the centres of the squares formed by the stones of the odd-numbered rows. The effect is thus to stress the diagonal lines as well as the main, cardinal orientation. Nearly all the examples of this variety include the numerically largest alignments. Since I reported these two varieties in the above paper I have had an opportunity to visit and record a number of new examples of both which I hope to publish shortly. They confirm the hypotheses of age and purpose set out in the earlier paper. One more feature demands attention: the orientation varies from true north to 20° east of north. About half the recorded specimens lie between 15° and 20° east. The reason for this is not clear but it may well relate to the system used in arriving at the orientation: Dr. Hunt has recorded somewhat similar figures for the orientation of graves.[2]

I. East of grave group III (Pl. 6) are about twenty stones of grey granite, several of which stand to a height of 6 feet. The stones have been roughly trimmed to give them a squarish section; many have fallen or been fractured and in some cases only heaps of splinters remained to mark their original position. However, there was one line of seven stones still more or less in position. One corner of the alignment may be seen in Pl. 8*b*, to the east of the large apsidal grave. A compass reading on the aligned row recorded 20° west of north: from this it appears that this line was a diagonal, and thus it seems probable that the original monument was of the diagonal variety. During our visit of 1957-58 we noted that the number of stones had decreased in the past five years, probably as a result of agricultural activities. A small excavation was made around a stone of this alignment and will be described below (Site III).

II. West of the same grave group is another cluster of standing and fallen stones, mostly slightly smaller than the first ones. It was impossible to discover the original numbers of stones in rows, orientation, or nature of the alignment, but there can be little doubt that it was originally a monument of the same class.

III. North of the central hills, in a little secluded valley, marked M on Pl. 6, a third alignment was noticed in 1952. There were in all about twenty

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[1] *Man*, LVI, 150 (1956).

[2] Hunt, E. H.: 'Hyderabad Cairns', *J.H.A.S.*, pp. 214-17.

(*a*) Area B, looking eastwards

(*b*) Area B

(*a*) Stone cist grave, grave group II

(*b*) Grave group III and alignment

stones of grey granite, squarish in section, and up to 7 feet in length: all except one had fallen. The orientation of the lines of fallen stones was close to the true north and it is probable that in the original plan there were four rows of five stones. However, when the site was revisited in 1957-58 it was noticed that a house and stone dam had been constructed nearby and the alignment had evidently been used as a source of stone. Thus only four stones remained to testify to the position of the monument in the south-western corner of the valley. This made me realize the deadly speed with which these ancient monuments are being destroyed, as already observed by both Foote and Munn. It also leads one to speculate upon the numbers of graves, alignments and other traces of ancient man which must have vanished at such sites in the course of centuries.

STONE ENCLOSURES

Four stone enclosures were noticed around the site. Two, both rectangular in plan, lie a short distance east of Area M (Pl. 6). Both were in the region of 20 by 30 feet but accurate measurements were not taken. The third enclosure, also rectangular, lay in the open ground south of P (Pl. 6). It measured 36 by 28 feet and had apparently entrances on the long, east-west, axis. The stones, now all fallen, must originally have stood to a height of several feet. The fourth was on the open ground south-east of E. Its size was somewhat greater than the other three but the stones were smaller. There is no indication of any remains in the centre of the enclosures, nor were any antiquities recovered from them. No example was excavated and it is thus not possible to discuss their age or purpose.

We may, however, notice that similar enclosures have been recorded elsewhere in the region. Indeed the great Shahpur tumulus described by Meadows Taylor was basically a rectangular enclosure of standing stones.[1] Another was noticed by Subbarao at Bellary: it lies north-west of the North hill on the open ground. It consisted, when visited in 1957 in company with Dr. Subbarao, of a rectangular enclosure of granite standing stones 15 by 30 feet, divided across the centre of the long axis by another line of stones. In the centre of the northern square thus formed lay a great stone 8 feet in length and 3 to 4 feet in diameter: doubtless it originally stood in this position. Stone circle graves exist in the neighbourhood. Another rectangle was recorded in the Gulbarga district by Meadows Taylor at Rakhamgiri,[2] and several other examples have been recorded at Mallur and Rajan Kallur in the same district. However, the Bellary example finds a parallel in an interesting monument noticed at Valigunda, on the Musi river near the 14th milestone on the Bhongir to Nalgonda road. Here a rectangular enclosure of 144 by 87 feet was divided by a central wall into two rough squares; in the centre of the northern enclosed space stands a single menhir of 11 feet, while a semicircular stone wall was built out from the southern side of the southernmost square.[3]

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[1] Taylor, P. Meadows: *Megalithic Tombs* (Hyderabad, 1941), pp. 36–42.

[2] *Ibid.*, pp. 33-34.

[3] *A.R.H.A.D.* (1940-41), pp. 3-4.

We propose to discuss the relationships of these various classes of grave and alignment to the examples recorded in other parts of the Raichur Doāb in a later work. The Piklihal examples are in few respects unique and can be properly understood only in the context of the distribution of such monuments throughout the entire region.

IRON SMELTING SITES

In explorations of ancient sites in the Deccan the finding of iron slag is common. At Piklihal it is probably true to say that all the settlement areas produce small quantities. However, a number of special accumulations were noticed which require separate mention. These spots are marked on Pl. 6 by a crossed circle (⊕). At each one considerable quantities of iron slag were noticed. For example, east of P, in a small saddle rising between two hillocks the entire ground is composed of fragments of slag for an area of several hundred square feet. There is a large cave on one side of the saddle, and the whole gives a feeling of privacy and secrecy. Just east of M is another such accumulation nestling beneath a high overhanging rock face on one side of a narrow valley. East of E is another accumulation in a somewhat more open but not dissimilar position. No excavation was done at any of these points and we were unable to gather any evidence of the age of the slag. However, the probability is that they are iron smelting sites of the medieval period when, as Munn inferred, the ferruginous bands to the south were in full use. The more careful study of such sites, of whatever age, is obviously a matter of some interest and it is to be hoped that one day it will be undertaken.

ASH MOUND

To the south of the central hills is an area of considerable size where the fields are strewn with fragments of ash. Examination reveals that it is identical with the products of the ash mounds of the region. It appears as though local agriculturalists had destroyed such a mound here. Across this area a low field wall runs built up of great blocks of ash, while to the south-east the graves of group II include several which have scatters of smaller pieces. When I revisited the site in 1957-58, having recently made a close examination of numerous ash mounds, I felt quite certain that this was, indeed, one of the class. A second accumulation of a white, powdery substance, appearing also to be a variety of the ash, was found high up on the north-western terrace of Area A (Pl. 6). In 1952 I did not recognize it as such, but in 1957 when I visited these sites with Dr. Subbarao he drew my attention to a very similar deposit on the top of Sanganakal and to another hill-top deposit elsewhere in Bellary. On comparing the deposit at Sanganakal I feel reasonably confident that both are varieties of ash from accumulations of the ash mound type. I shall not deal here in more detail with this problem as it is to be the subject of a special report upon the excavation undertaken at Utnur in 1957.

Rock Paintings and Bruisings

In the course of explorations many rock paintings and bruisings were noticed, both on the central hillocks and on the hills adjoining them to the north. These are marked on the plan with the sign of a bull's head (Pl. 6). The problem of their absolute age and of the relative age of the various styles represented is most acute: it becomes correspondingly easier to discuss as the numbers of examples increase. For this reason we shall content ourselves here with listing the main examples of each style and commenting on the general sequence. The argument as to date will be treated more thoroughly in a later paper when the considerable material from other sites in the Doāb and in Bellary can be called to account. However, we may make one general comment which appears at present to be crucial to consideration of this problem: they represent a type and tradition of activity and as such must be studied in the context of other human activities in the neighbourhood. Their distribution, at this site no less than at others we have visited, clearly overlaps with the distribution of settlements and other remains. Thus we may well look for the origins and continuation of the tradition within the main periods of human activity found at the site.

Engravings.—Very few examples of engraving are found, perhaps because the hardness of the rock renders them laborious. But within a few yards of a farmhouse west of the 13/2 milestone an obviously recent *nāga, cakra* and *śaṅkha* were deeply engraved on the rocks. Again, south of Area C a *Viṣṇupada* was noticed, engraved. Both these must date from recent centuries.

Painting in white.—Next in rarity come paintings in white paint. Near the foot of the hill between J and K a modern boundary stone bears an outline drawing of a bull and a name in modern Kanarese script, painted in a simple lime wash. At another place north of the main site some small figures of men with swords were observed in a similar pigment; another group was seen in Area C.

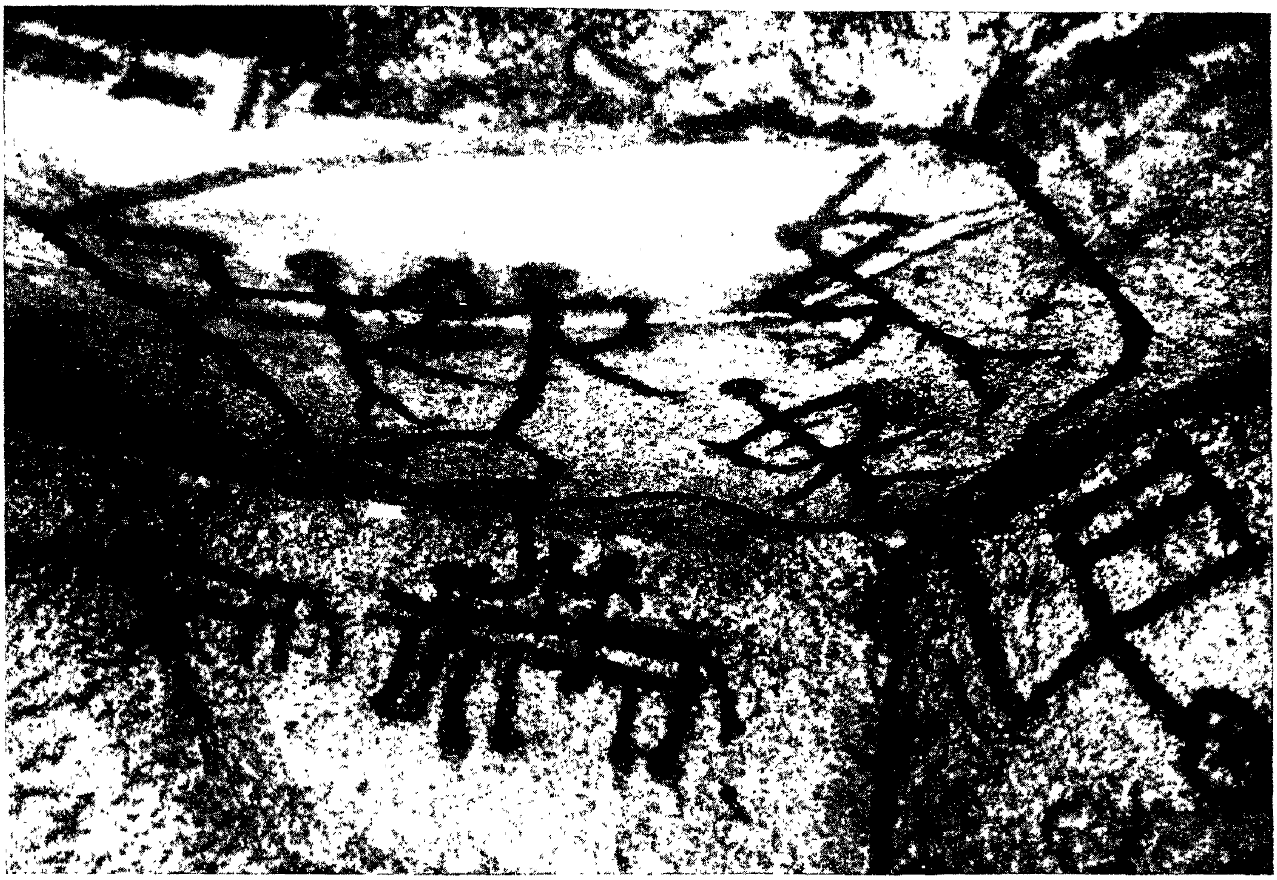
Paintings in red on a white background.—At two places on the southern slopes of Area C paintings were seen of this class. In one case the painting, whatever it may have been, had been smeared over and obscured at a later date, but in the other, near the western end of the area, a hunting or military group was depicted, including figures of horsemen with raised spears, pedestrians, an elephant with raised trunk and rider, a curious compartmented circular affair, with smaller figures in it, perhaps a fort or a camp, and numerous other unrecognizable objects. The red colour used was an earthy haematite, the white a lime wash.

Paintings in red.—There are more paintings in red than in either of the two above groups and the styles they reveal are much more varied. At the eastern end of Area C is a small isolated pile of rocks which contains a tiny cave, whose walls and roof are covered with crudely drawn representations of men with swords and of two riders on an elephant (Pl. 10*a*). One group is apparently engaged in a stick dance. An indeterminate horse or bovine is depicted. The style is not far removed from that of the military scene referred to above.

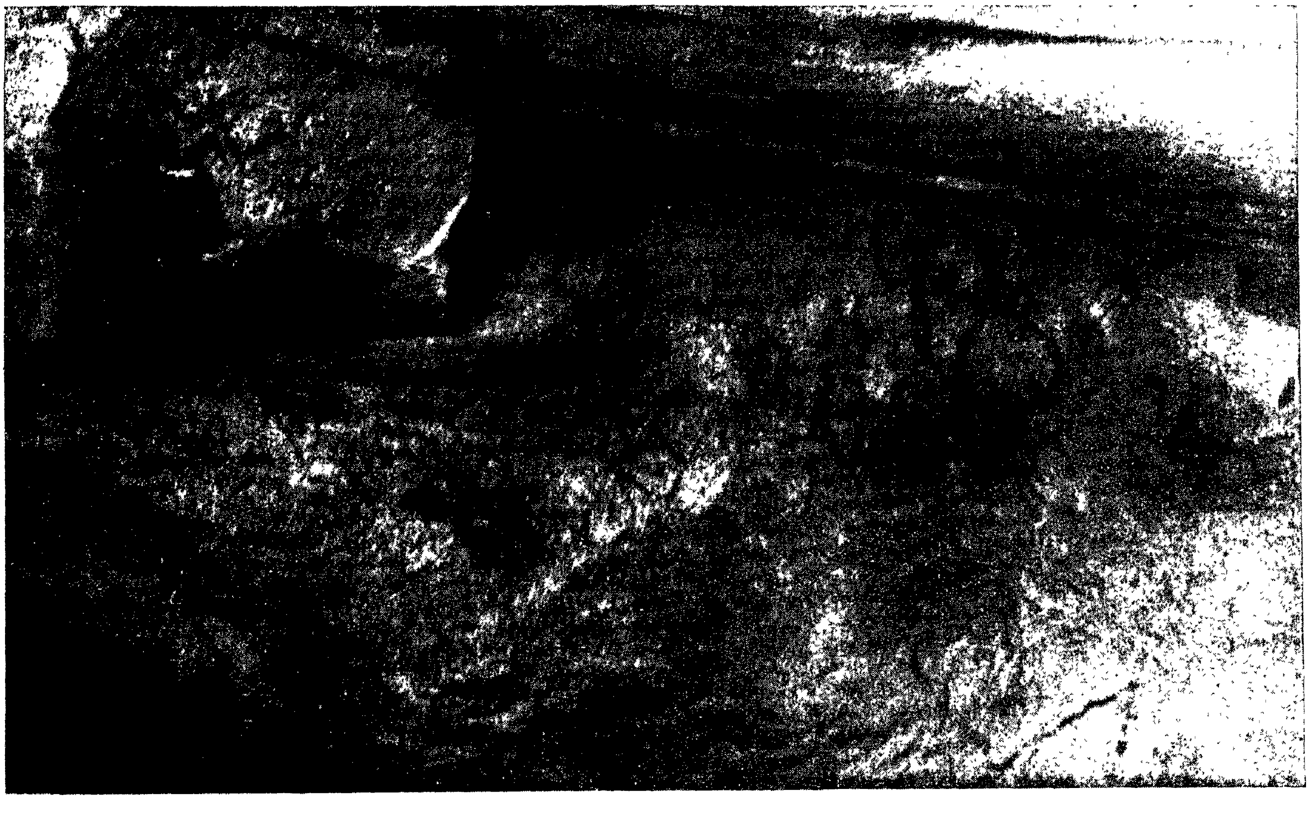
The remaining paintings in red fall into two categories :

(*a*) At three places to the north of the main site and usually hidden from it by intervening rocks are natural caverns or overhanging rock shelters. At the first of these ('P' on Pl. 6) are depicted a large *makara* or lizard, a well-drawn sheep, behind which is what appears to be a dancing figure with upraised arms and mask or head-dress, and various smaller and less distinct objects. At the other end of the shelter is a small tree, with stylized dotted branches, and a bull. The second cave, N, lies about a furlong farther north in the rocky waste. The style and technique of the signs is similar but there are many more of them. They include the *makara* or lizard, a snake framed with straight lines, a roughly drawn elephant, crosses, a five-pointed star, taurines, circles, squares, and other unrecognizable objects. The third cave lies to the east of the 13th milestone (Pl. 6, G). Once again there are closely related signs, although they are less easy to decipher, and the style is more corybantic than that of the other two. Above is a large dancing figure with arms and leg raised; below a curious geometric affair which might be either a structure or a figure seated upon a platform; on either side are lines of dancing figures and a strange creature resembling a giant termite (Pl. 10*b*). Beside this shelter there is a deep cave; while a few yards away is a modern stone-built shrine of the goddess Huligamma. There is a certain unity of style in these three cave groups. The remoteness of the spots and the nature of the signs suggest that they may have been associated with some sort of tribal religious activity.

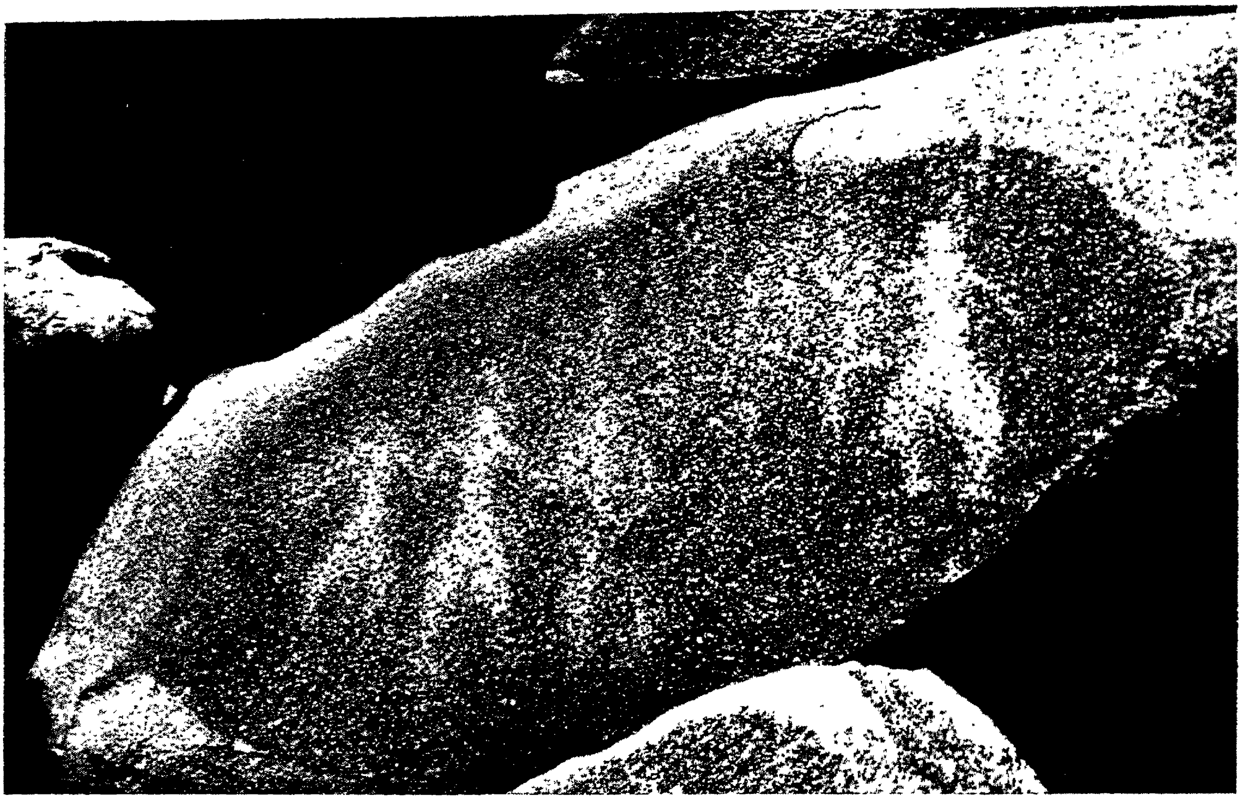
(*b*) The final group of red-painted figures consists almost entirely of bulls. The finest examples are those upon an overhanging rock north-west of the 13th milestone (Pl. 6, L). They are depicted in the frontispiece, and a detail is given in Pl. 13*b*. This rock, which is typical of those chosen for painting, stands about twenty feet above the fields it overlooks; it is approached by a little access way, which leads up to a narrow cleft big enough to take two or three persons. The figures are in various hues and depths of red, but it is not at all clear whether this has any relationship to age; certain very faint figures seem to have been drawn over at a later date. Belonging to the clearest group are seven bulls, characterized by delicate drawing and great vigour. The finest have long curving horns ornamented at the tip by bows or cloths, the humps are long and curved, the stance vigorous (Pl. 13*b*). Below these are other examples, often incomplete, which are in a similar style: one animal seems to stand before a man. Before one of the finest bulls is drawn an animal in a completely different style, crude, heavy and ill-proportioned; the colour of this beast is very pale. Another larger beast is better drawn and obviously earlier than the first group; behind it is a large mass of very pale red which I am unable to resolve into anything meaningful. Finally, at the foot of the rock is a long curving line of similar colour. The second example of such a bull comes from the canopy rocks in Area C already referred to. Here a slight overhang has left one portion of the rock protected and relatively little weathered and a lively bull is preserved there. The style is not unlike that of the preceding examples. A further group of smaller and less well drawn bulls occurs in a little cave just above the ash mound site. Finally, in a rock shelter on the top of a hillock east of the site (Pl. 6, F) is depicted



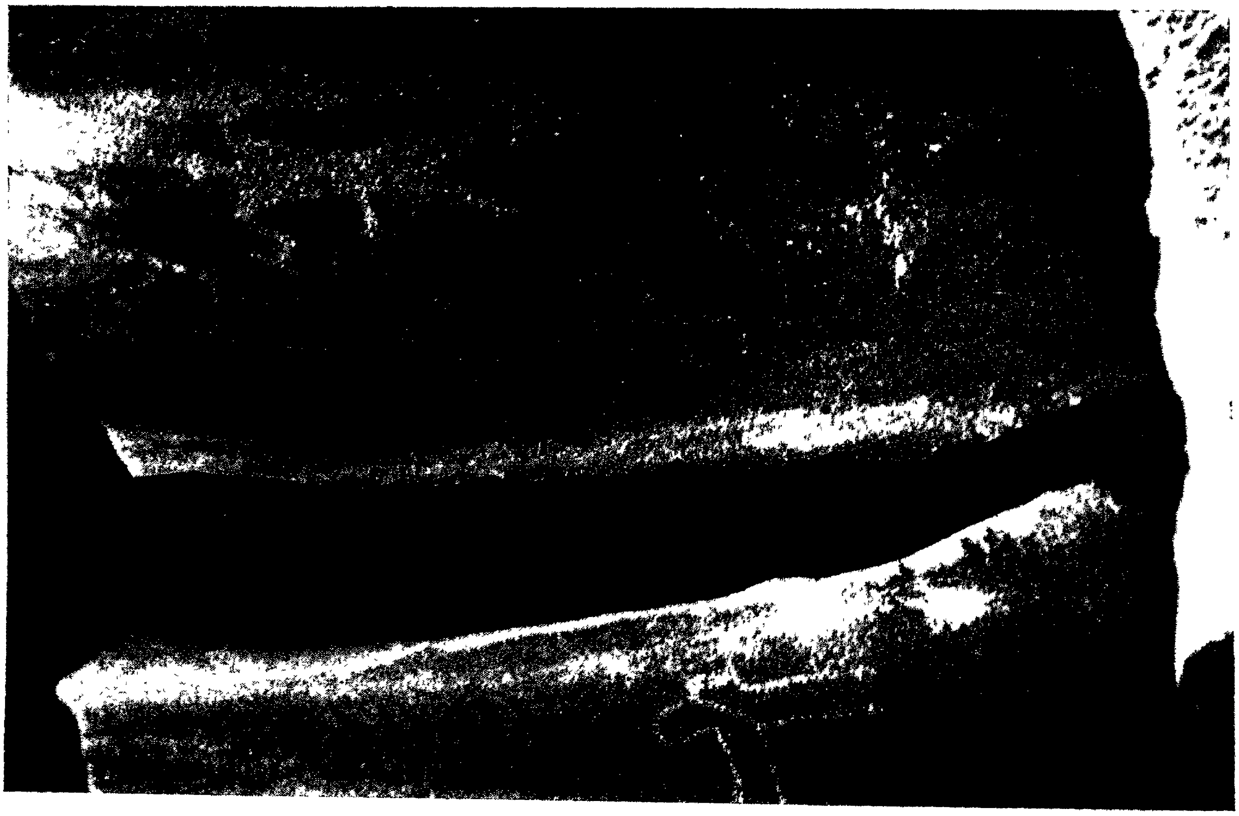
(*a*) Rock paintings from canopy rock east of Area C



(*b*) Rock paintings from cave at G



(*a*) Rock bruising south of Area A



(*b*) Rock bruisings at H

a long line of *sāmbar* deer. The bodies of these animals are drawn in outline whereas those of the bulls are all in silhouette.

In conclusion, we may summarize the information presented by the entire painted group. The paintings have only survived upon surfaces which are protected from the weather by overhanging rocks, or by virtue of their position inside caves. It is impossible to say whether other paintings did once exist in less sheltered situations. The favoured spots have to this day a freshness and greyness of the rock surface which should not be taken as indicating their youth, for where they have been at all subjected to weathering the same surfaces have often become deeply patinated. The surfaces of the unprotected rocks have turned to a golden brown or a deeper colour. There are several quite distinct styles, some of which relate to paintings assignable to the end of the series. To speak of any except the whitewash, and perhaps red fighting figure groups, as paintings is inexact. All the other examples are in fact crayon drawings executed with pieces of red haematite. The fighting figures seem to have been painted with a mixture of powdered haematite and water, perhaps applied with the finger.

Bruisings.—The bruisings which we are now to describe form the most numerous, conspicuous and stylistically varied of any of the kinds of rock art, both at Piklihal and at other sites of the Deccan. In some cases the styles are closely related to those of paintings, in others they are quite different. Once again the analysis of the relative age and sequence of series must await broader comparisons: here we shall try to describe the chief examples. The technique employed in producing the bruisings is fundamentally the same throughout, although here too there are variations which may in part reflect the age and durability of the techniques. An important distinction in the choice of sites for rock painting and bruising arises from this difference. The haematite pigment is easily removed by friction or constant washing with water: therefore only in protected places have such works of art survived. The bruising is most effective when it is done upon a rock which has already acquired a deep surface staining as a result of the action of weather: hence exposed surfaces are invariably chosen. The bruising technique, which in no case amounts to engraving and scarcely ever to scratching, involves the pecking of a weathered granite surface with some kind of hammer, alternatively a hard point may, in rare cases, be drawn across the surface. This latter process is probably much less durable than the true pecking which produces an extremely lasting discoloration. After the work has been done the exposed surface continues to weather and thus the different examples are found to have widely differing degrees of patination. Whether these are in any way linked to age, apart from the most obvious cases, is hard to say; and made harder by the probability that certain pieces have undergone rejuvenation, sometimes no doubt accompanied by considerable change. Again the degree of discoloration and patination is certainly partly controlled by the position and nature of weathering exposure. We shall describe the different bruisings in terms of certain regularly recurring themes which dominate the great majority of them.

(*a*) *The bull.*—Great numbers of bulls occur in and around the site. Near the Śaivite shrine at J (above p. 5) the rocks bear many crudely scratched and angularly drawn bulls. They resemble the painted example alongside a modern Kanarese inscription; none of them is likely to last for many centuries as the drawing is weak. Similarly angular and faint drawings, all of comparatively recent date, are to be found on the rocks near H and F. All are only outline drawing, the horns are generally straight and ungraceful, the body is rectangular and ugly. In one case, near H (Pl. 6), the horns are shown with trifurcations at the tip (the whole specimen closely resembling one illustrated by Gordon, from Bellary.)[1] A group of very considerable interest, south-east of E (Pl. 6), was I believe executed between the dates of our earlier and later visits. Even if not it clearly belongs to the first group. It shows four bulls led by men: the tails, legs and humps are all ungainly, the horns erratic, the bodies have been cross-hatched with diagonal lines. They occur on a rock with much older, heavily patinated human figures beneath them. A final example of this group, though apparently a retouch of an earlier now obliterated bull, occurs outside a cave east of H, together with an outline of a temple and a *triśūla*. This identification of the bull with Nandi is characteristic of the Deccan rock art as I shall show in a later paper.

A second group of bulls includes mainly much larger specimens drawn by somewhat similar techniques but with greater freedom and sense of movement. The examples given in Pl. 13*a* are typical. In one case the horns are shown as exaggeratedly long and bending forward, as in the paintings near L (above p. 12), in another the whole body has been pecked over. Yet another, smaller specimen of this class comes from near H. This closely resembles the red-painted bull near the ash mound. The whole effect is one of grace, the lightness of the animal being stressed. Finally, we may note a group of heavily patinated bulls also overlooking the ash mound. Two are shown facing each other and apparently, for the whole series is far from clear, with crossing heads and horns: probably a bull fight. Beside them are two more bulls also facing each other but perhaps with a human figure standing between them. The condition of the rock surface in this example is very bad. Below again and more heavily patinated than either of the previous specimens are two bulls, drawn with tremendous grace and vigour, with fine curling horns and delicate legs, carefully articulated; above the whole group the fore part of another animal of similar style and patination is visible. If patination is any indication of age, then these specimens should belong to the oldest bruised bulls.

(*b*) *The human form.*—The second commonest theme of the bruisings is man himself. We have mentioned above the very recent group of men leading bulls, perhaps ploughing. This rock, east of E, shows two small human figures: the first is an attempt at outline drawing, one hand is raised while the other hangs behind with the rope, the second is drawn by just the same formula as that of the painted men from the canopy rock (Pl. 10*a*), that is to say as a specialized

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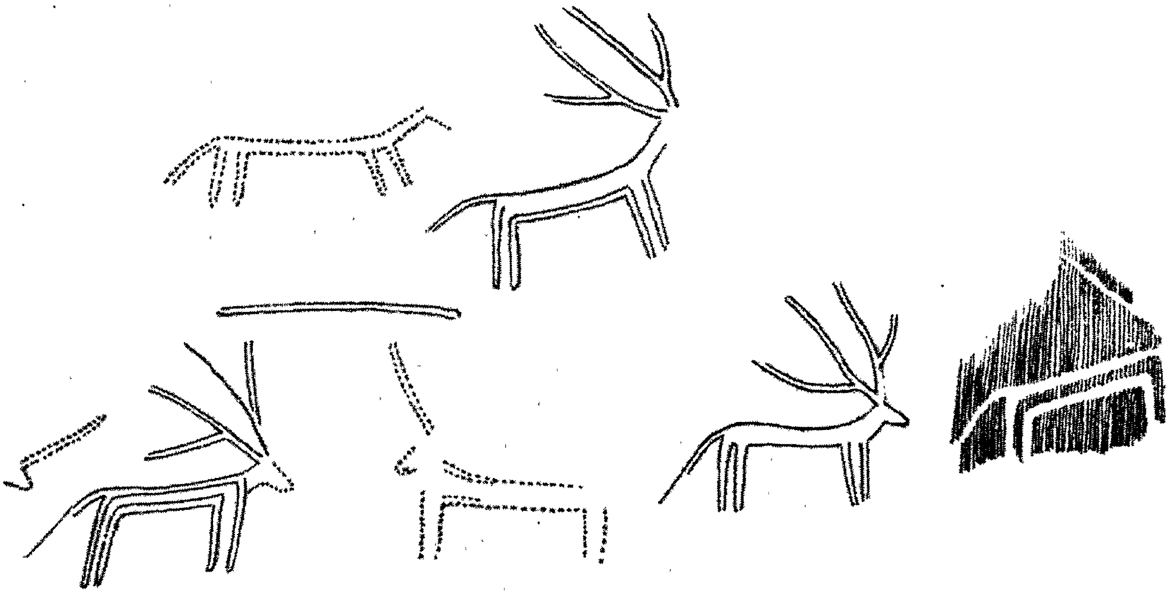
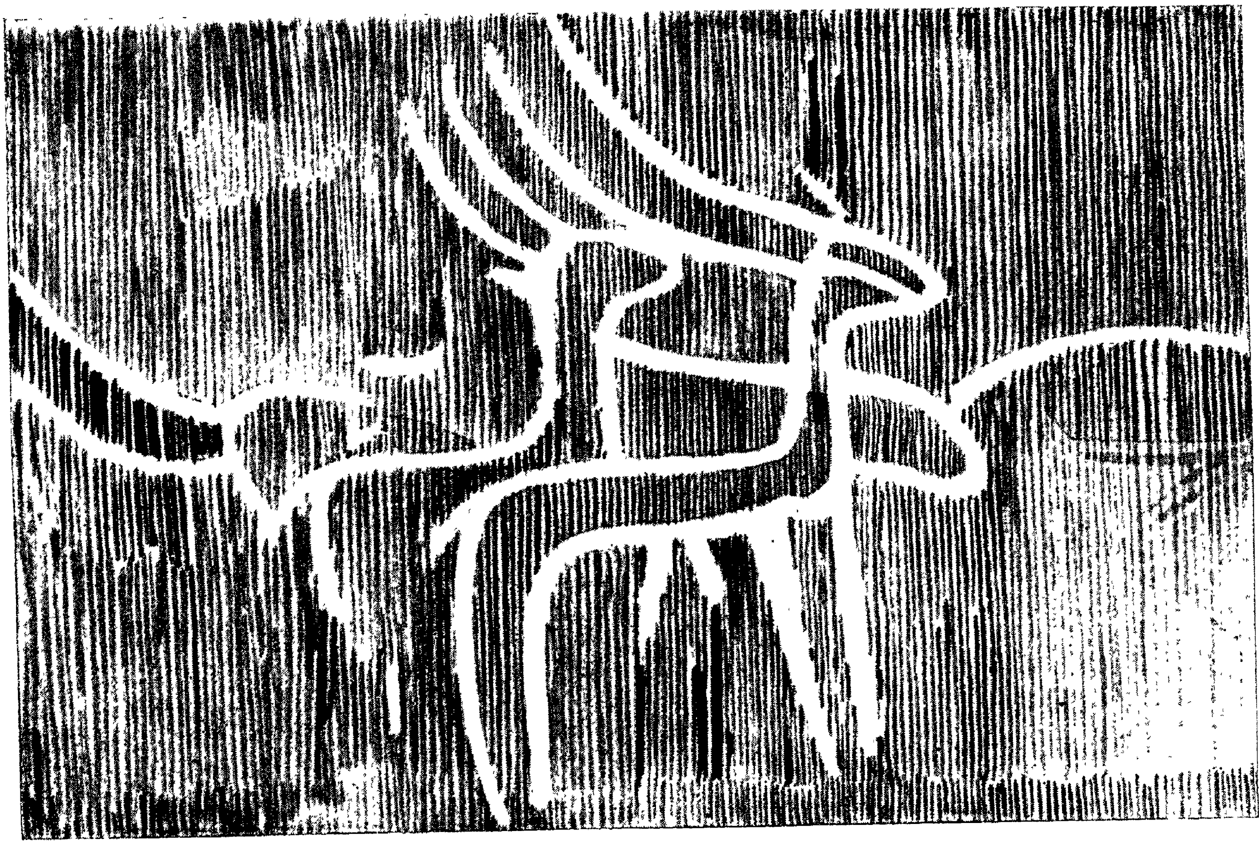
[1] Gordon, D. H.: 'Rock Engravings of Kupgal Hill, Bellary', *Man*, LI, 204 (1951).

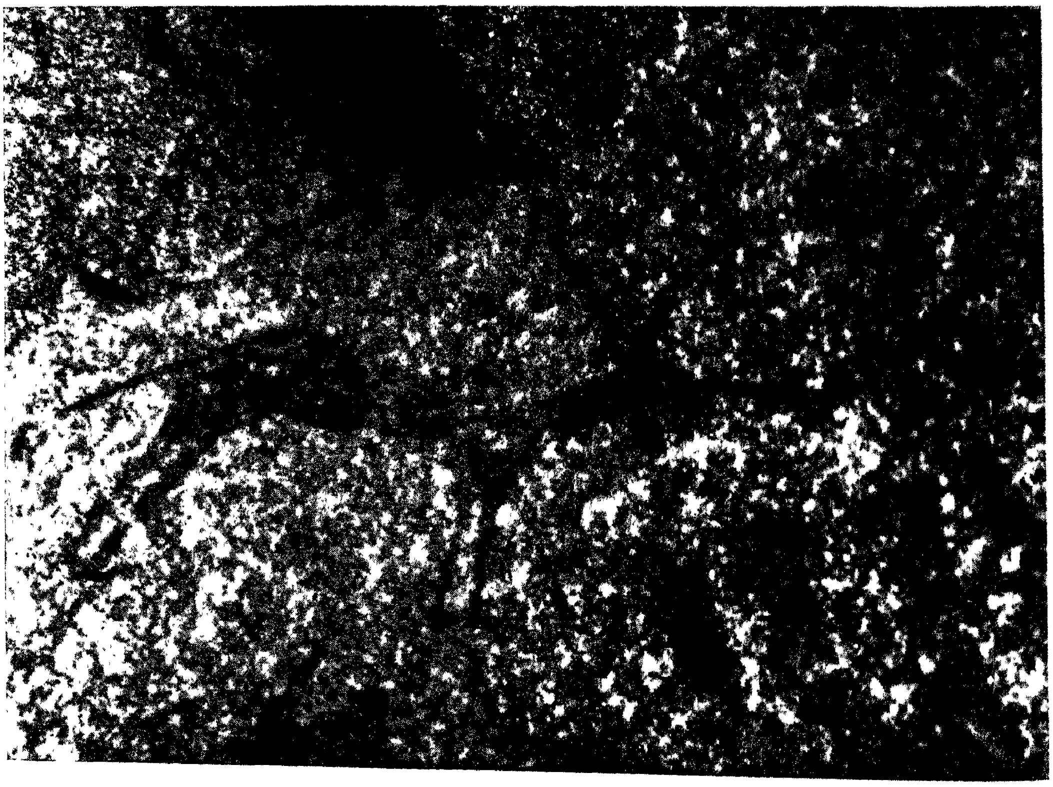


(*a*) Rock bruisings north of grave group III



(*b*) Rock bruising near Site VI

(*a*) Rock bruising north of Area D



(*b*) Rock painting at L

form of 'pin man'. A second figure, bruised in outline, probably belonging to this group, is on the canopy rocks east of C. Here the man is shown with three dots representing eyes and mouth. He has a raised sword in his left hand and another at his waist, his right hand holds the halter of a horse. A somewhat similar, although much larger, figure of almost life size is to be seen on the rocks south of A. It is superimposed on a faint bruising of a large bull of style similar to those of the ash mound group. To the left of this figure is another, also almost of life size, in a quite different style. This is a silhouette of a man of exaggerated length. The characteristic feature is the ballooning of the thighs which are broader than any other part of the body. The effect is not unlike that of a dhoti but it seems unlikely that it is intended to represent one. In the left hand, which is flexed at the elbow, is a long staff resting upon the ground. The other arm is similarly flexed but carries nothing. The head is small and undistinguished. The whole figure is fairly heavily patinated, and is now very faint. On a nearby rock are several more figures of similar style, also heavily patinated (Pl. 11*a*). In the lower register is a line of three dancers holding hands in a characteristic fashion, above is a single figure and to his right are several indistinct marks. All of these have the ballooning of the thighs. A third group in this style appears on a rock near H (Pl. 11*b*). Only three figures are visible in the illustration, but one more very faint bruising can be discerned on the rock to the right. The central figure has been rejuvenated but otherwise all are heavily patinated. The upper three have the flexed arms and ballooned thighs of the earlier group, while the lower left-hand example has at least one arm hanging down. The central figure holds in the right hand a short stick and in the left a long staff. The upper left-hand figure has also been touched up, but the older form is still quite clear. The head is unusually large, suggesting that he is depicted with a mask. The three left-hand figures appear to be ithyphallic, but in at least one case the detail might be a more recent addition. On a nearby rock there are several additional human figures. Two are standing side by side and resemble the earlier examples, a third is either dancing or holding a bow. Above is a smaller, more lithe figure with raised arm holding a spear and forearm outstretched. Before we consider other examples with spears we may notice a final representative of the ballooning type from the canopy rocks east of C. Beside him stand two more figures but they are quite indistinct. In an inaccessible place, high above the western end of A, there is a small figure of a man with legs apart and one arm flexed, holding above the head a spear, the other arm is outstretched. There is no sign of other work on this particular rock although below is an interesting pair of animals to which we shall return. A little to the north of this figure, near the upper ash deposit, is a larger than life spearman apparently in similar posture. Sadly, the passage of time has completely obliterated his whole body, for a rain drip line runs across it, but the front hand with each finger outstretched can be clearly discerned, as can the raised rear hand and the shaft of the spear. It is not possible to make out what, if any, special type of point the spear possessed. Nor can it be seen whether there is any object at which the spear is aimed.

(*c*) *The horse* is only depicted in one very rough and palpably late bruising, along with a human figure already described.

(*d*) *The buffalo* is depicted in two bruisings, once in clear association with animals of the chase, the other alone but indistinctly. The first place is on the rocks north of grave group III. Here one or two buffaloes are shown together with a line of *sāmbar* deer. The whole is fairly deeply patinated and may be quite old. The second context is on the rocks in the north-west extremity of A. Here there is a large animal whose body is shown much in the style of the heavily patinated bulls of the ash mound group. The bruising has weathered to a deep brown and very little can be made out, but the horns appear to be those of a buffalo. This should be a very ancient example, but may also possibly represent the *gaur* or Indian bison.

(*e*) *The* sāmbar *deer* is depicted, north of grave group III, in a style very similar to that of the painted specimens at F. They are shown in Pl. 12*a*, in a tracing made from the actual rock.

(*f*) *The gazelle.*—These delicate animals are shown in one beautiful and sensitive group at the south-east of A. Pl. 12*b* is a tracing from the rock which on comparison with a photographic copy faithfully renders the original.

(*g*) *The sheep and the goat.*—Only one bruising occurs which can be taken to represent a ram. This unfortunately is a confused and uncertain example, the horns are perhaps decorated and something not unlike a trunk hangs from the nose. However, in the circumstances it is wrong to compare it with the strikingly similar Indus valley seal type for what appears to be a trunk may well be fortuitous. A sheep is shown in a painting already mentioned. There remains one perplexing group from the north-west of A. Two creatures are shown facing each other: the hind quarters, tails and bodies resemble goats, the heads are, however, set upon long necks, their horns are long, heavy and curling and could well be those of rams, exaggeratedly large ears hang down beneath the horns. The front legs in both cases are raised and meet in the centre. Thus, the scene appears to be a goat fight. Another possible interpretation cannot, however, be quite ruled out: that the fore parts are semi-human, and that we have a representation of some sort of centaurs.

(*h*) *Miscellaneous.*—The only structures depicted are the two scratchings of temples or *lingam* shrines above a cave between G and H. They have every appearance of being recent, as does a scratching of a European style umbrella nearby. Beside the shrine is shown a new looking *triśūla*, and under it a bull. At two places curious objects are shown. The clearest example is near Site VIII (Pl. 6). Here there are six pairs of what appear to be offering-stands. They are fairly heavily patinated but quite clear. The only other likely interpretation of them is that they are head-rests of the kind Foote reported from Mysore. South of 'A' several somewhat similar objects are shown.

We have now described all the principal rock bruisings and paintings so far discovered at Piklihal. We suggested in introducing the subject that in order to consider their age we must consider them in the context of other human activities at the site. At this stage we shall not go farther with the question but shall allow the paintings and bruisings to speak for themselves.

THE EXCAVATIONS

AIMS OF EXCAVATION

Having made the observations we have described and having completed several months in the survey of many other sites in the Raichur Doāb, it was possible to summarize the evidence they presented and arrive at a fairly accurate picture of the culture sequence at the main settlements. I have already quoted the notes made at Piklihal at this time (p. xii). When the opportunity of excavating came I was thus able to draw upon two main bodies of information in planning the work. First, there was previous work done in the region including Foote's surveys, the excavations of Sir Mortimer Wheeler at Brahmagiri and of Dr. Subbarao at Sanganakal. The former had successfully demonstrated, for the first time, the broad elements of the culture sequence and had shown the relative position of the stone cist and circle graves. The latter had confirmed, broadly, the main sequence, adding a probable pre-Neolithic level; it had also shown the rightness of Foote's hypotheses of the 'Castellated Hills' of Bellary. But there was now also the considerable body of field observations which we had collected. It now seemed possible to recognize a Neolithic settlement area, in much the same way as Foote claimed to do; and our aims, in these circumstances, were to advance from the position reached, rather than merely repeat or check the evidence. Incidentally, of course, it was hoped that evidence would appear to confirm Wheeler's sequence, particularly where it seemed slightly indefinite. Accordingly before starting to excavate I set down the following aims :

1. To investigate the nature of the field-terracing systems and try to establish their age. Since Foote's brilliant observations[1] little attention had been paid to what he called 'the problem of the terraces or "linchets"'. My own observations supported Foote's ideas. The aim was therefore to investigate the problem excavationally, within the necessarily limited scope proposed.
2. To attempt, as far as possible, to discover more 'cultural information' about the Neolithic people, who they were and how they lived; to seek particularly for information of the crops they cultivated and the animals they hunted or kept. Thus to collect carefully any bone samples, and grain impressions, charred remains, etc.
3. To extend the known culture sequence of Brahmagiri and Sanganakal to the Raichur Doāb and if possible provide constructive comments upon it.

THE TRENCHES

SITE I

A ten-foot square was excavated, by way of trial, in the centre of Area B, about 25 feet from the southern boundary rocks. The sequence revealed is given in Pl. 59. Natural moorum was reached in a small area only, between large granite boulders, at a depth of about seven feet. The sequence of layers was as follows:

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[1] Foote, R. B.: *I.P.P.A.*, pp. 27–29.

Layer 1.—Humus containing much pottery and occupation debris.

Layer 2.—A deep layer of powdery earth producing comparatively little material and probably the product of prolonged agriculture. It contained many fragments of shattered spherical urns of red and chocolate B3 ware which had probably been used for cremation deposits and later destroyed by the plough (the field is still under cultivation).

Layer 3.—A lighter brown soil which had a definite surface containing a large pit. In both the pit and the layer were a mixture of B1, B2 and 3 ware sherds. The pit also contained several fragments of broken saddle querns of granite.

Layer 4.—A continuation of the same soil, but without any sign of B2 painted ware. The occupation debris was not abundant and the layer probably represents a further period of cultivation, etc.

Layer 5.—A similar continuation, producing a few sherds of similar wares to layer 4: also probably a period of prolonged cultivation.

Layer 6.—A darker, more loamy soil, containing only Neolithic sherds. This layer produced much more debris than the earlier ones. It appeared to seal a deep pit, or rather series of layers, which occupied the entire area excavated. This now became increasingly limited by the granite boulders which appeared.

Layer 7.—A further dark earth containing much Neolithic pottery.

Layers 8–11.—A series of alternating dark compact soils, and ashy intrusions. The layers contained a wealth of Neolithic pottery, some of it A3 painted ware, and the fragments of unique bell-shaped jars of A2 ware (Form 38*a* of Pl. 27). The total Neolithic deposit was of an average thickness of 3 feet 6 inches.

SITES II–IV

These were three small exploratory trenches, two upon graves of group III, the third in the adjacent alignment. The object of the first two (Sites II and IV) was to examine the relationship between the ground level at the time of construction of the graves and the modern ground level. It was also to provide dating evidence for the graves. The intention was not fully to excavate a grave, as our resources of time and labour did not permit it and many had already been well reported at Brahmagiri. The dating evidence in both cases was supplied by finds of sherds of red-and-black B1 ware and in one case of a complete vessel (No. 25*a* of Pl. 37) in the entrance way to a grave. The other problem yielded results substantially similar to those at Brahmagiri and, more recently, at Maski. The soil formation process under certain conditions is apparently very slight and is more or less balanced by processes of denudation: thus there has been very little alteration in the level since the graves were constructed.

The third trial trench (Site III) was a ten-foot square around a standing stone of the alignment. As far as I have been able to discover this was the first attempt at a properly recorded excavation of such a monument. The square was carried down to natural moorum throughout. The evidence which it revealed was, however, slight. In the surface of the moorum several shallow depressions, of no more than six to nine inches, were recorded. These produced several distinctive sherds of red-and-black B1 ware described in the catalogue below. They thus gave support to our inference that the alignments were contemporary with the grave-building period. The depressions, I infer, are in some way connected with the business of erecting the stone, which still stands to almost six feet above ground level and must weigh several tons. The stone itself had been erected in a deeper pit, about eighteen inches from the old soil surface, and packed around with smaller pieces of granite to hold it in position. It thus accords well with the more massive examples excavated at Maski by Mr. Thapar in 1954.[1] These were, however, provided with much solider and larger supporting bases. The dating evidence from Maski exactly concurs with that of Piklihal. I have since obtained similar evidence from two other alignments in Nalgonda district reports of which I hope to publish shortly.

SITE V

A six-foot square was excavated, by way of trial, within the stone foundations of a circular building in the medieval fortified Area C. The pit was situated in the north-eastern part of the area. Five layers were excavated to a depth of three feet: no solid floors were encountered and the whole deposit appeared to be made ground. It contained mainly fragments of brown or grey D1 ware together with numerous pieces of broken glass bangles. These were predominantly of brown glass with yellow decoration, but green and blue pieces also occurred. Owing to lack of time the cutting was not completed and virgin soil was not reached: thus the interesting possibility that in this area there may be evidence of continued occupation from early historic to medieval times could not be investigated.

SITE VI

An eight-foot square was excavated in a small enclosed terrace in the south-eastern part of Area A. No floor surfaces were encountered in the four and a half feet of deposits, which appeared to be without any real stratification. However, there was a certain homogeneity about them which can only have resulted from some sort of occupation or utilization over a limited period of time and thus they are of some interest.

Layer 1, below the modern humus.

Layers 2 and 3 were grey powdery soil containing considerable quantities of B1 ware together with A2, A4 and 5 wares. The surface of layer 3 was differentiated from the preceding one by a scatter of irregular stones. It produced several granite saddle querns and rubbing stones and the toe bone of an elephant.

Layer 4 was a thin spread of occupation deposit on top of hard granite moorum between granite boulders.

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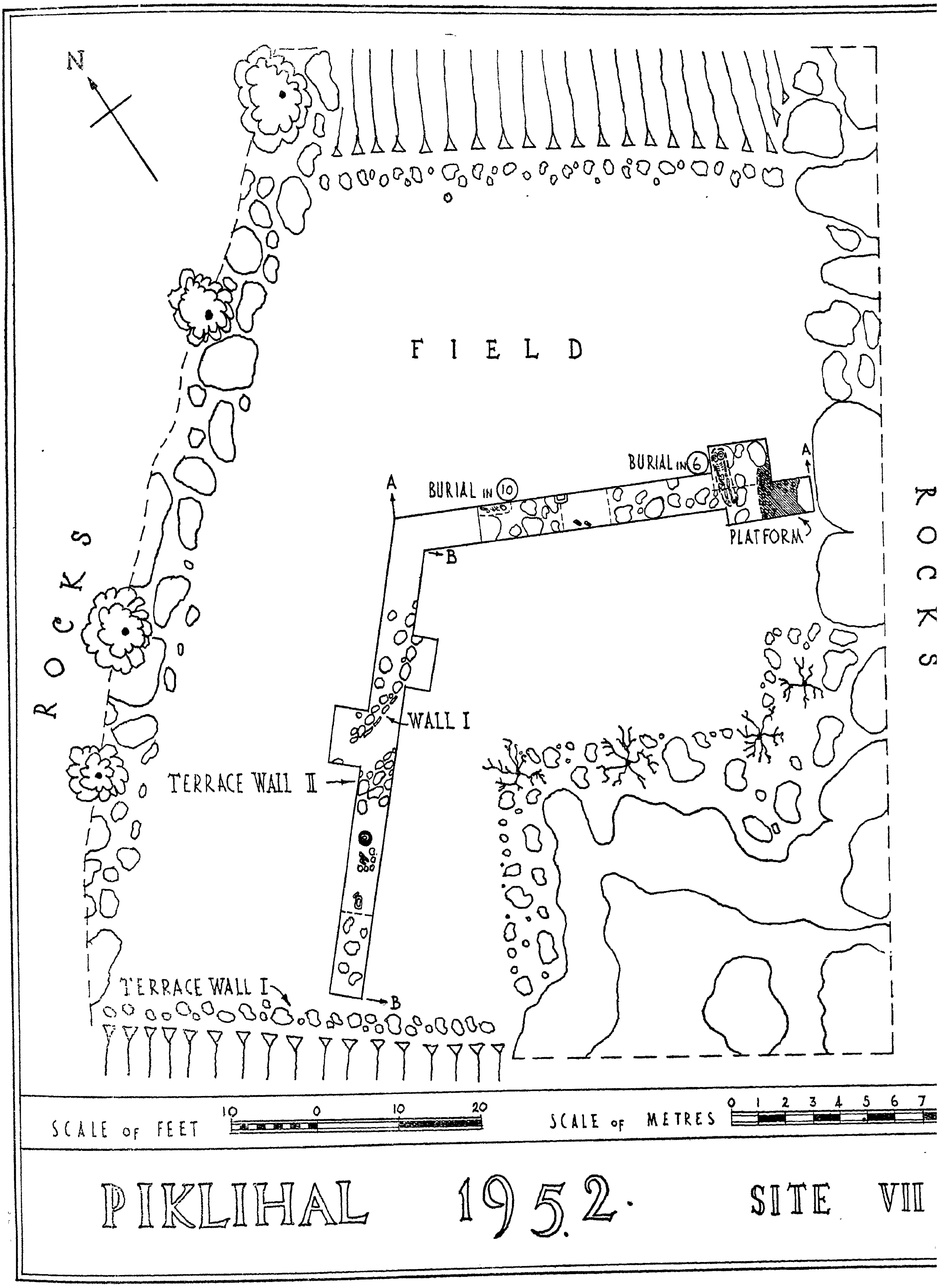
[1] Thapar, B. K.: *Ancient India*, No. 13, p. 35.

SITE VII

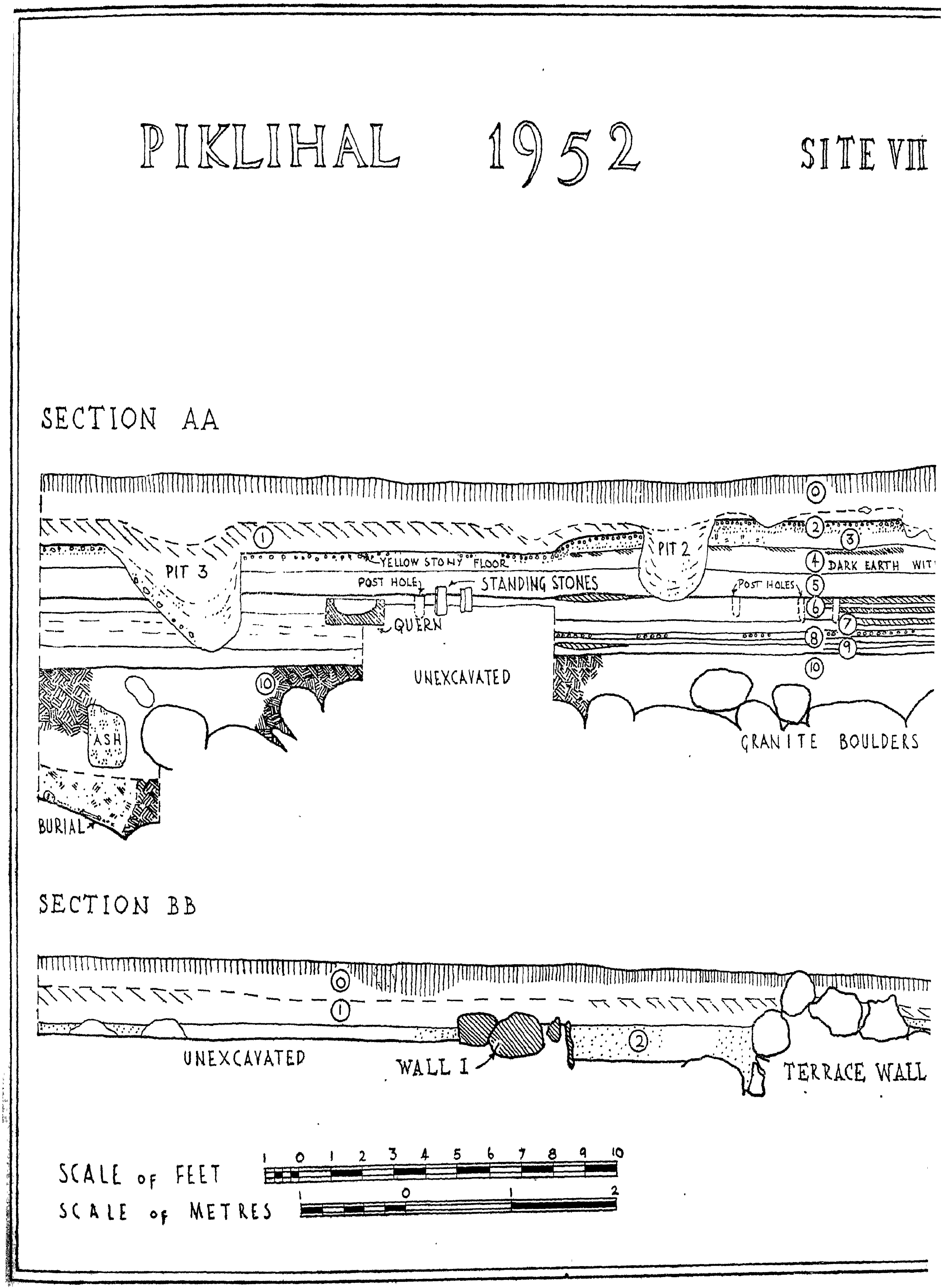
A four-foot trench was cut out from the rock face of a small saddle in the north-east of Area A. It was subsequently extended to the centre of the saddle and thence at right angles in a southerly direction to the terrace wall (*see* plan, Pl. 15). The trench was enlarged whenever it was found expedient but basically it was only four feet wide. This minimal width was chosen because our aim was to try to link two important elements, the terrace wall and the rock shelter. The overall length of the trench was 102 feet. It is to be regretted that it was not possible to widen the trench as certain crucial pieces of evidence emerged, particularly the few sherds which led us to postulate an intrusion; until a more extensive area can be studied this evidence remains very slender. Another weakness of the limited scale of the excavation was that at certain points large pits had almost quite destroyed the earlier strata. We shall refer to that part of the trench which lies near the rock shelter as the south-eastern sector, that which lies near the terrace wall as the south-western sector, and that which lies between as the central sector. The modern field was cultivated at the time of excavation. Pl. 14 is a panoramic photograph taken from above the rock shelter. Pl. 16 is a ground section of the north-eastern face of the eastern arm of the trench (AA) and the southern face of the south-western arm (BB).

Layers 0 and 1 form the modern humus and plough soil. The lower part is often irregular and cut about, probably by agricultural activities. The layers contained a mixed collection of B1–4 wares with a very few medieval D ware fragments. Neolithic A wares were present in fair numbers but always in rolled and weathered form. They also produced a number of beads including cylinders of agate and lapis lazuli. The layers contained typical samples of both the ground stone and siliceous blade industries. This fact demands comment: it was observed that all levels, both Neolithic and later, contained examples of nearly all types of tools in varying proportions. It is to be accounted for by two principal factors, the indestructibility of stone artifacts and the washing down from higher levels of earlier deposits. While pottery which has been derived in this manner is recognizable by its worn and weathered appearance, these artifacts often show no traces of such derivation. Their presence in post-Neolithic layers throughout Piklihal cannot therefore be taken as indication of the survival of the stone using tradition, nor can we show from the evidence before us when this tradition did in fact disappear. However, as will be seen below, there are indications—if slight—of degeneration in the stone industries and certainly the Neolithic levels produced the greatest abundance of artifacts.

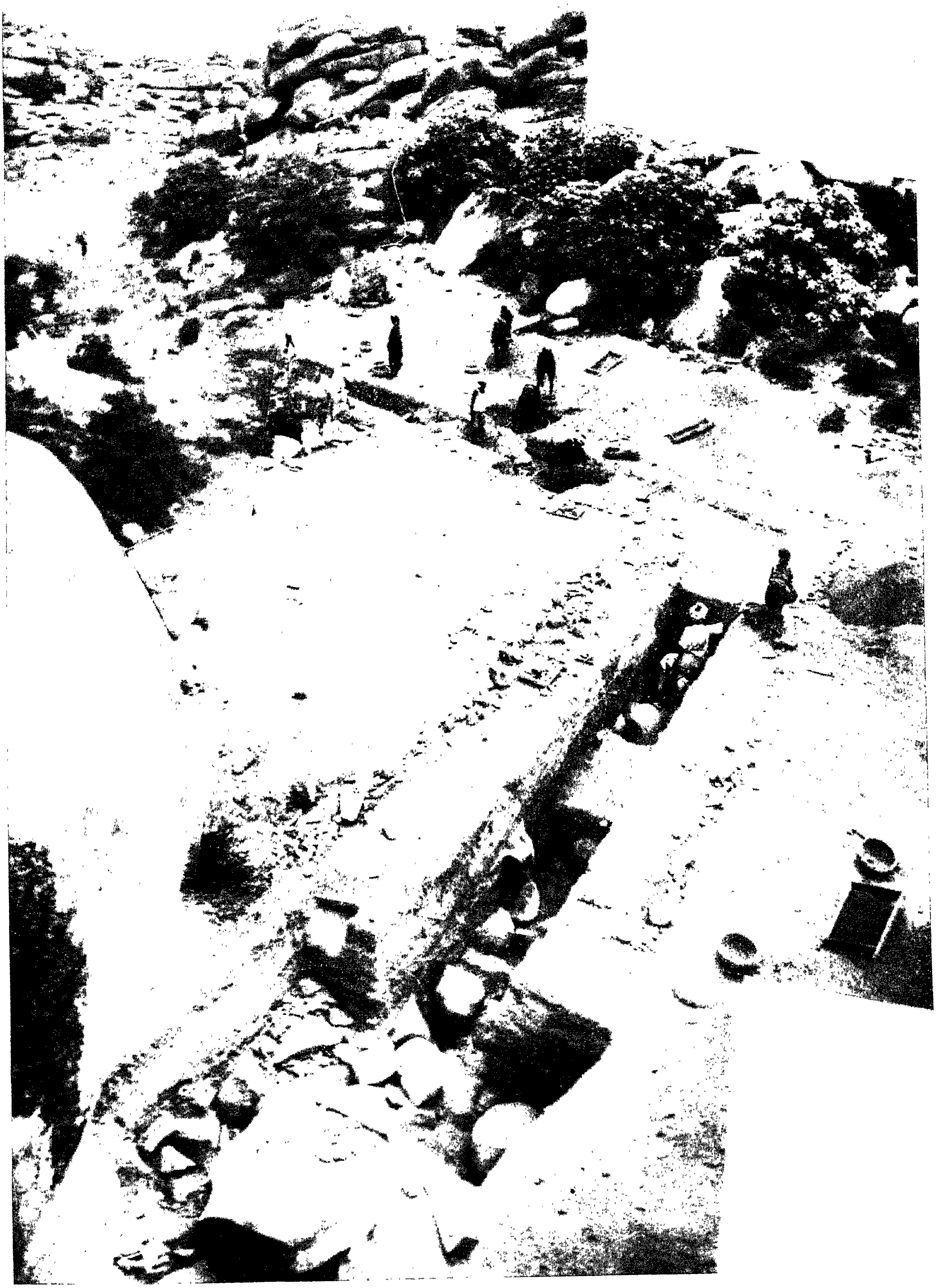
Layer 2 was characterized in the south-eastern sector by a hard yellow stony floor surface. In the central sector this faded into a slightly yellow earth; and it disappeared altogether beneath the cave entrance. The floor, also, was cut by a number of (?) plough marks and by a number of pits. Pit 1 (which is not visible in the section) had been dug from the floor level; it was lined at the bottom with a layer of yellow gravel. It contained a deposit of objects including an iron sickle, a knife blade, an arrow-head and several other fragments of iron, a



Site VII : plan



Site VII : section of



Site VII : panoramic view of trench

(a) Wall foundation I, Site VII

(b) Occupation floor, Site VII

copperplated disc of terracotta, and in the filling of the pit fragments of red-and-black B1 pottery and a crystal bicone hexagonal bead (these objects are described and illustrated below in the appropriate sections of Part II). Pit 3 contained mixed sherds and fragmentary animal bones including those of cattle and goat. The level of the yellow floor was not constant but rose towards the centre in two small steps of 4 to 6 inches.

Layer 3 was a brown earth make-up beneath the floor. It did not occur in the other parts of the trench. It produced a small fragment of iron and a number of beads.

Layer 4, extending over a wider area, was a darker coloured layer distinguished by quantities of charcoal upon its surface. In the south-western sector layers 2 and 4 become indistinguishable. In this sector they revealed a series of granite chips and boulders laid to form the foundation of a wall (Wall I on Pls. 15 and 16). This curving wall could not be followed beyond the narrow confines of the trench; nor was it possible to recognize the plan of which it formed a part (Pl. 17*a*). Both the wall and the yellow floor complex seemed to have been built against the mass of boulders forming Terrace Wall II of Pls. 15-16. This terrace wall is thus clearly earlier in time.

Layer 5 consists of a light brown earth scarcely distinct from that of layer 4. Both layers have no exact counterpart in the south-western arm of the trench but appear to represent a time of cultivation, or at any rate of slow accumulation of soil behind Terrace Wall II. The pottery included both later Neolithic wares and B1 and 3, red-and-black and red wares. In the lower part of the layer the occupation debris lying above the next layer was encountered. This included fragments of the rim of a white copper bowl, quantities of animal bones, shell and wood ash, as well as a broken granite quern, several pieces of tortoise shell and a stray A3 ware 'horn'; finally this layer produced a single sherd of the intrusive AB ware.

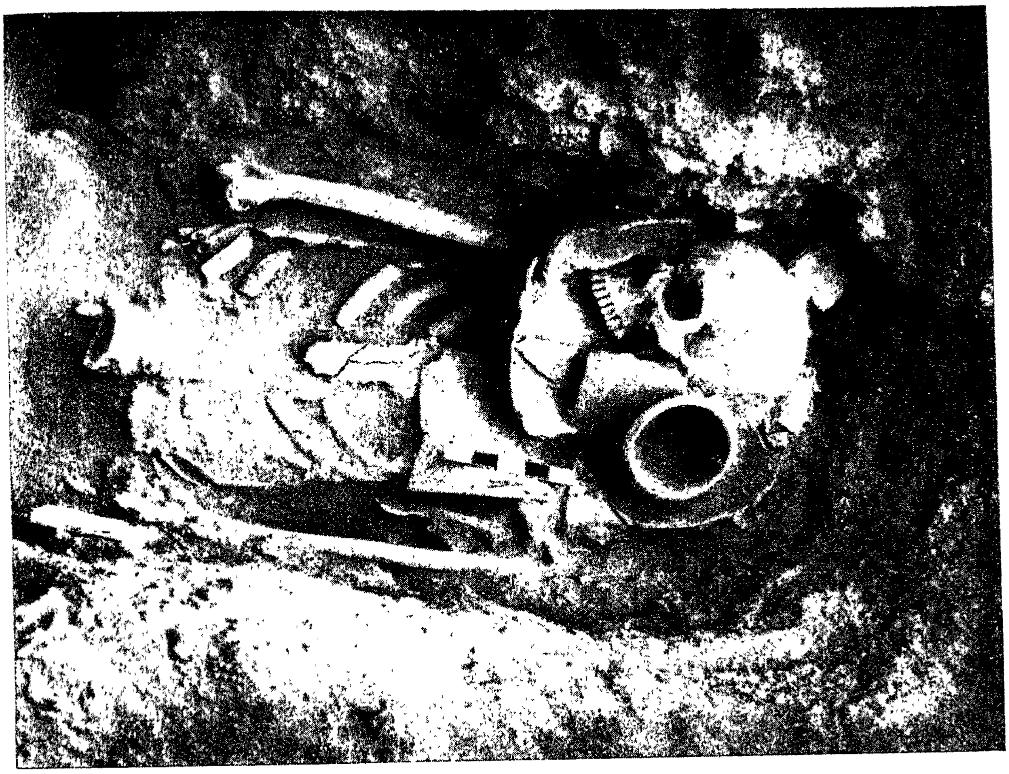
Layer 6 represents an important change in the nature of the deposits; and the beginning, or rather end, of a period of regular occupation. Below there was no further trace of B1 ware, A wares surviving alone. The debris on the surface of the layer produced a single further sherd of AB intrusive ware. In the south-eastern sector the floor took the form of a thin regular smear of dung and clay extending right up to the rock face. In the floor were several post-holes, several feet beyond there was an accumulation of ash and charcoal, apparently a hearth, and beyond that again three short granite posts were discovered forming a triangular base. Beside this the uppermost part of a saddle quern appeared in the floor (*see* Pl. 17*b*). Towards the central sector the floors had been largely cut into by extensive later pits. Under the surface there were no less than four thin remakings of the floor within this layer. These had evidently been periodic in nature and contained very little cultural debris. Such pottery as did occur was of A ware. The rectangular quern had apparently been set up in the lowest level of the layer and then gradually bedded more and more deeply in the subsequent remakings. There can be no doubt that these various remains constitute evidence of a Neolithic living floor, perhaps even hut foundation. Midway between the rock face and the hearth a group of small stones marked the covering of a grave dug into this layer. Excavation revealed an extended burial (Pl. 18*a*) in a shallow coffin-shaped pit. The body lay upon its back with the head inclined to the right. The head was roughly oriented towards the north. To the left of the head a spouted jar of A2 grey ware was placed and by the loins there lay a tall vase of similar ware. This had evidently broken during interment for one large sherd from its rim was recovered near the skull (Pls. 18*a* and 30*a*). In the south-western sector the nature of the deposits is somewhat different. Once again the surface of the layer seems to represent the end of a series of regular developments. This sector was only excavated up to Terrace Wall II. Here, too, an elaborate hearth was found, surrounded by stones and finally roughly buried by them. On one side of the hearth were three standing chips of granite, resembling those noticed above, forming a triangle with sides of about eighteen inches and a height of about fifteen. A basalt axe had evidently fallen into the fire while it was still burning and been fractured by the heat: the fragments were all recovered and assembled to make the complete specimen (Pl. 49*a*). Hard by the hearth a pit was excavated which contained a large, broken storage jar of A1 buff ware (Pl. 27, No. 34*h*). There was no evidence of what this vessel had contained. A short distance below the hearth a small oval saddle quern was found in the floor with an oval rubbing stone still resting in it. Under this surface layer 6 consisted of a thick accumulation of soft ashy soil, mixed with copious potsherds and bone fragments, apparently occupation detritus.

Layer 7. Two similarly remade floors were excavated as layer 7. The finds included a large ground stone axe and pottery as for the preceding layer. Numbers of animal tooth and bone fragments and shells were found. In the south-western sector the layer was of lighter colour than 6 and produced another ground stone axe.

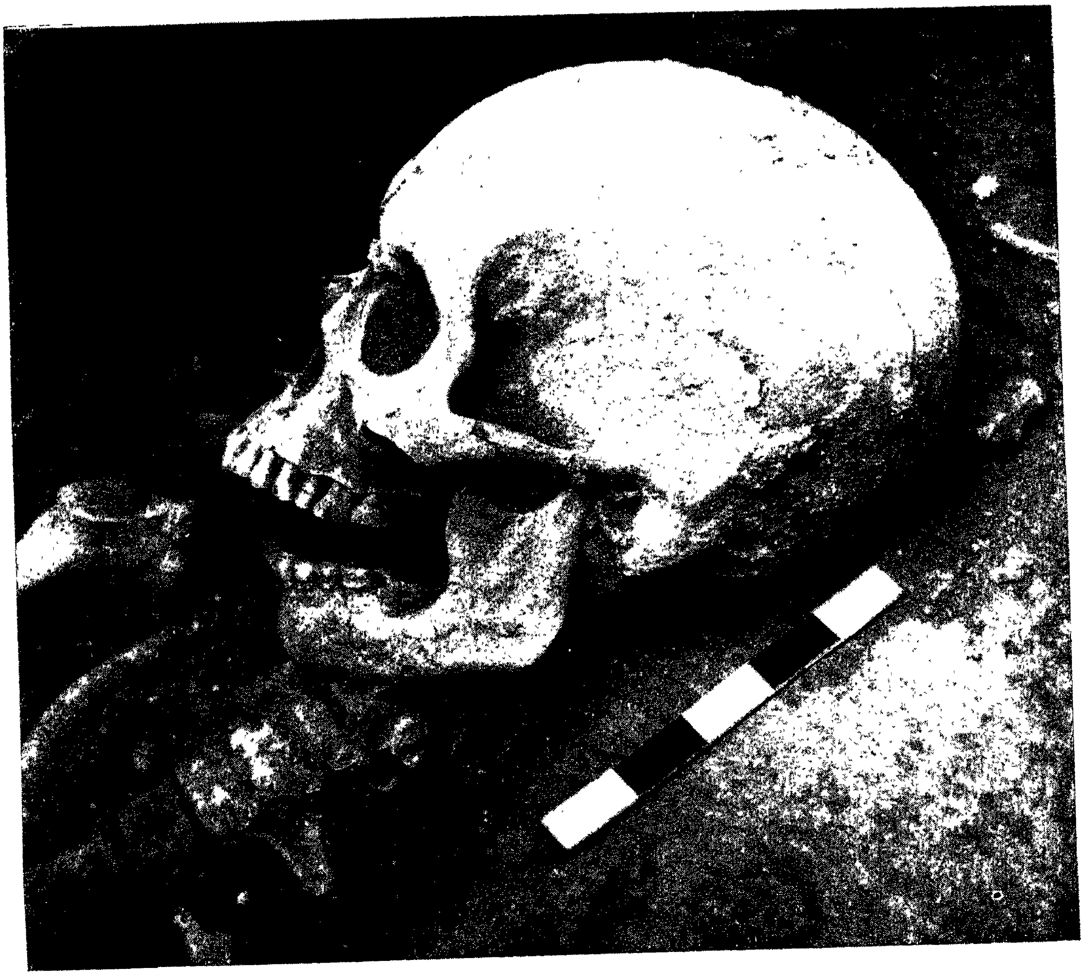
Layer 8 consisted of two more floors, the upper having lumps of lime upon it. There were also several post-holes on a different alignment to those noticed above. The finds included several fragments of calcified goat dung, a pottery 'horn' of A3 red ware, a perforated sherd, and fragments of mud daub, some burnt through, but with the marks of woven wattle still visible. Also there were fragments of bone and animal tooth.

Layer 9 consisted of two final floors, having spreads of ash, further calcified goat dung, animal bones and teeth, the blade of a polished dolerite axe and a sherd of A3 painted ware. In the south-western sector the layer consisted of a fine reddish, ashy, soil, with similar occupation debris to the preceding layers.

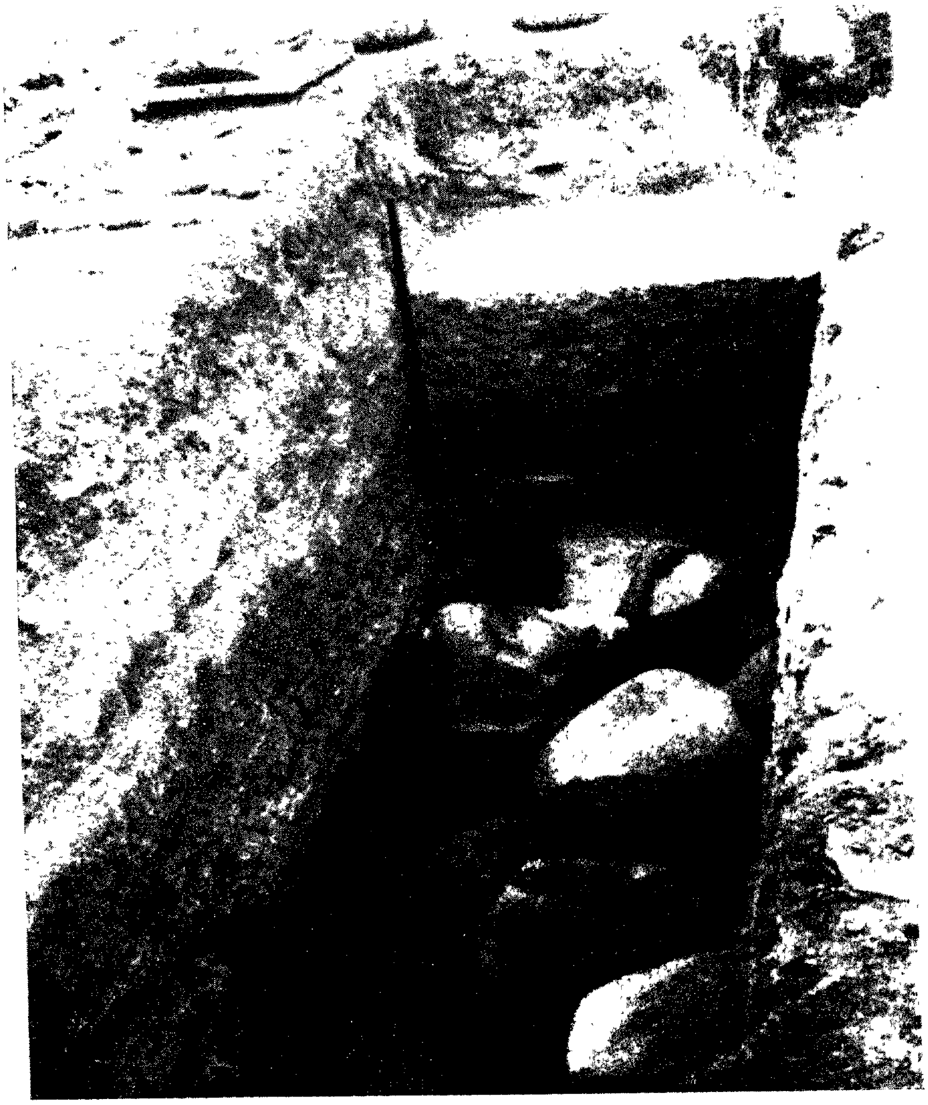
Throughout the last three layers in the south-eastern sector, in front of the rock shelter, a rocky surface had been emerging. The true character of this was now revealed: it was a rock-built platform in front of the rock shelter. Around this platform and throughout the whole excavated area of the trench, including also the south-western sector, was a deep undifferentiated layer of loose, dark, gritty soil (*Layer 10*) which stretched down to the granite boulders that limited



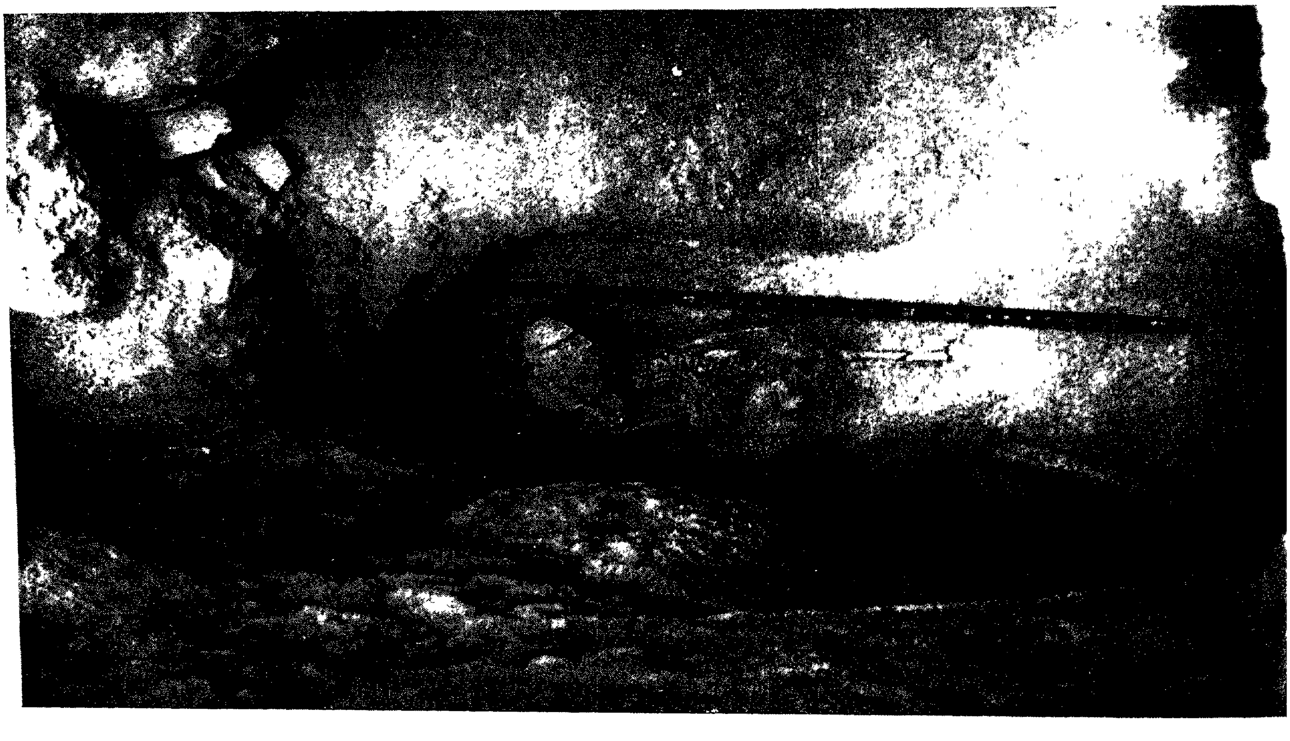
(*a*) Site VII : burial in layer 6



(*b*) Skull from same burial



(*a*) Site VII : south-east face



(*b*) Site VII : burial in layer II

the excavation. Particularly in front of the platform this layer contained large quantities of debris in the form of sherds of A1–3 wares, stone tools and animal remains. The pottery included A3 painted ware, A1 perforated sherds, two legged stands of A3 red ware (Pl. 34*c*), and numerous legs from similar stands or horns from figurines of this ware. Also of this ware were parts of two figurines of humped bulls of very distinctive form (Pl. 41*a*, and Pl. 40, Nos. 2 and 3). In addition the layer produced numbers of animal bones and teeth, and a small number of snail shells. All these antiquities are examined below in the appropriate sections of Part II. At the northern end of the south-eastern sector a small pit was encountered about one foot in diameter and slightly more in depth. It was full of very finely powdered wood ash but contained no other remains. Almost directly beneath the pit, upon the very bottom of the trench, was the skeleton of a child, lying on its right side, with head roughly towards the south-east. There were no grave goods (Pl. 19*b*). In the south-western sector the excavation of the Terrace Walls could not be completed but it appears that Terrace Wall II was built upon the surface of layer 10. During excavation of the stone-built platform further typical debris was encountered, including a ground stone axe, a fragment of another figurine of A3 red ware and several pottery 'horns'. That this platform was in existence before the accumulation of layer 10 is apparent from the section at its northern limit. Here the layer clearly rose up against the side of the platform, as did the floors above it. It thus appears that the platform represents the earliest settlement in this vicinity and that it remained distinct until, by the end of layer 6, the general ground level had risen so far as to cover it. In the south-western sector the layer was excavated in two parts, the lower part being numbered 11. Here it also produced further typical debris.[1]

SITE VIII

As we have already seen this site is situated in a small plain surrounded by rocks, lying south-east of Area C. The soil is very poor and the area is not cultivated. At the western end there is a terrace wall beyond which the ground falls slightly to the plain near the ash mound. At the eastern end access is had to the wider terraces leading to Area C. Two pits were excavated, they are marked A and B on Pl. 20 and we shall refer to them as Sites VIIIA and VIIIB respectively. In the south-west of the area a line of boulders marks off an oblong piece of ground (marked D on the plan) which produced from the surface a large number of sherds of B2 painted ware including the fragments reconstructed to form the vessel illustrated in Pl. 38. The small extension C was cut in order to obtain more evidence about parts of a legged cist of which one leg was discovered in the corner of VIIIA. The chief aim in this area was to provide confirmatory evidence to that of Site VII. After the uncovering of the platform near the rock shelter in this site it was realized that the cutting at VIIIA was less likely to give this type of evidence than one nearer the rocks and thus B was started close to the rocky limits of the site.

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[1] It should be noted that in Part II finds from layers 10 and 11 are generally described as coming from layer 11. This does not indicate that they are derived only from the south-western sector.

VIIIA

Layers 1 and 2 (Pl. 21) were a more or less undifferentiated soil beneath humus, containing a mixed bag of B ware sherds with a regular admixture of D ware. Near the surface a roughly burnt 'leg' was discovered reminiscent of the legs of some terracotta sarcophagi. In order to discover more of this the area was extended in the square C and three more legs were unearthed. These are illustrated in Pl. 42*a*. With them were found many fragments of coarse ill-fired earthenware which might have belonged to the body of the vessel.

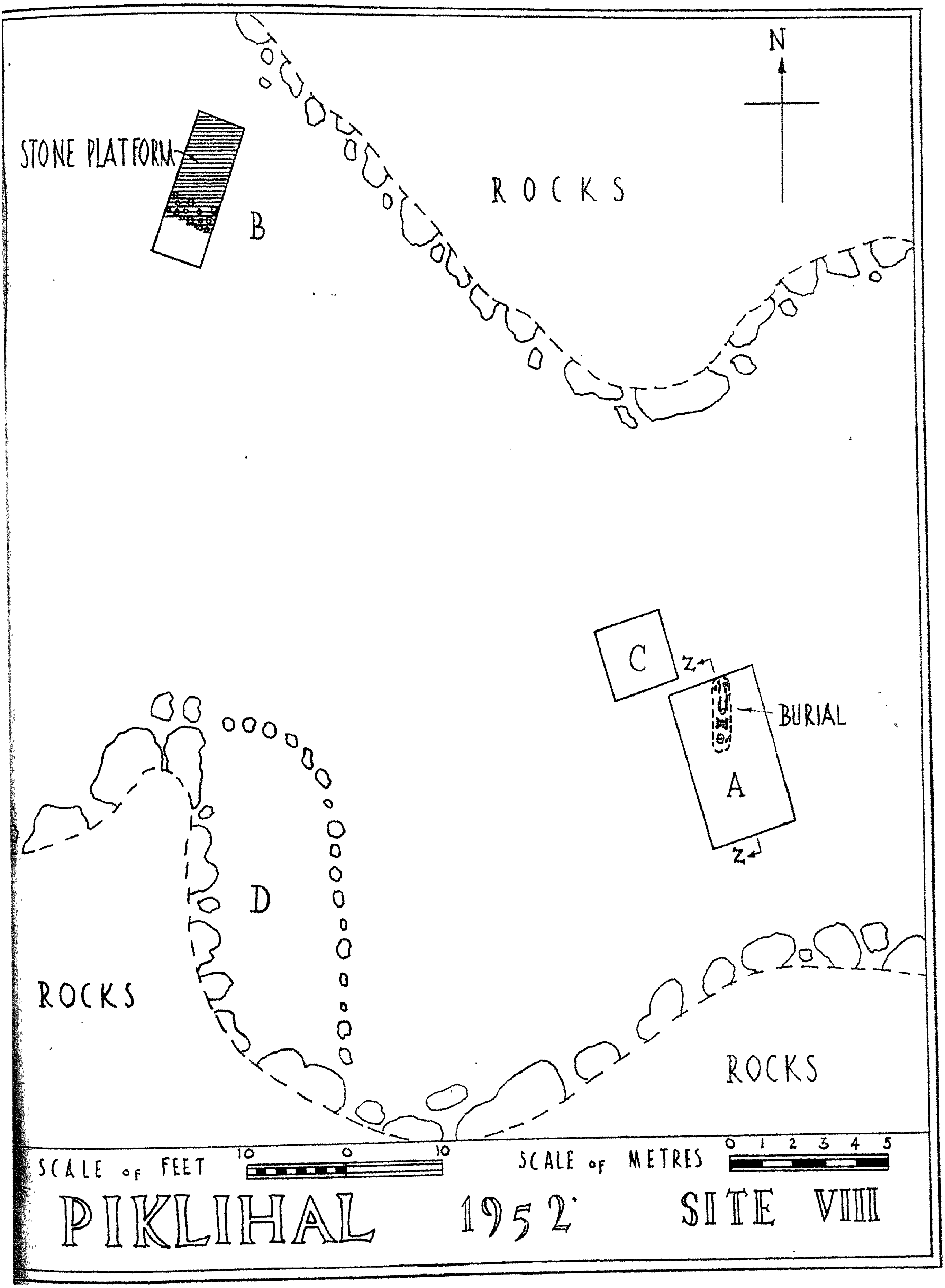
Layer 3 lay beneath a clear horizon; it was of a darker earth than layer 2. It produced mainly B ware sherds together with many fragments of iron slag. On the surface of this layer was a spread of charcoal, apparently connected with some sort of hearth. In spite of this evidence the pottery contained in this layer was much comminuted and appeared to be derived rather than *in situ.*

Layer 4 is a layer of clearly demarcated yellow earth, lying below a definite horizon. Although the surface of this layer is less than three feet below the modern ground level, beneath it were unmixed Neolithic deposits, which although mainly detritus and not apparently *in situ* produced a quantity of pottery in good condition. On the surface of this layer was discovered a copper chisel (Pl. 56, No. 10) described below. Pottery was mainly fine A2 and A3 ware, including further legged stands of A3 red ware and ten incised sherds. In a shallow grave, whose limits it was impossible to determine, but definitely cut from the surface of the layer, a burial had been made. The body lay on its back, the head towards the south (Pl. 22*a*). On the right-hand side of the skull lay five large chert blades, parallel to each other, while at the feet were two very worn basalt axes (Pl. 23). The five blades were well above average size and the raw material finer than that of most Piklihal Neolithic blades. Near the pelvis were recovered a few fragments of ill-fired A1 ware, apparently from a small bowl, while above the body the scapula of a bovine was discovered in the grave. Finally a large boulder on the surface of the layer seems to have marked the limit of the filling in.

The skeleton rested on yellow earth exactly similar to that above and around it. This produced cultural finds in no way differentiated from those of the upper parts of the layer. Beneath was the dense red-brown moorum.

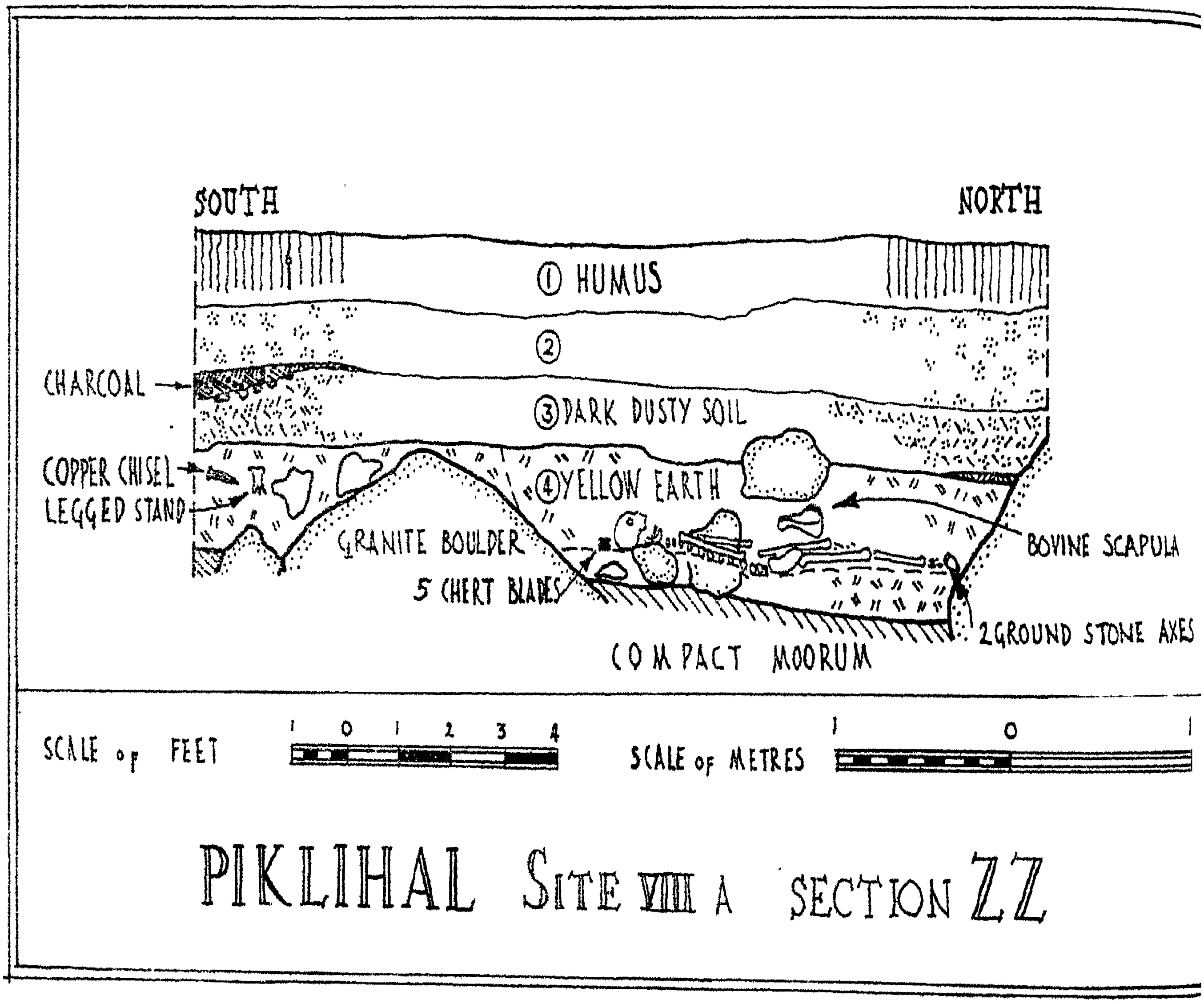
VIIIB

This trench was in point of time among the last to be excavated and could not thus be extended to check the results obtained. It was found that a large pit which cut right down to the natural rock in one end of the trench had passed unnoticed during excavation. It contained mixed deposits of B ware and D ware together with quantities of iron slag and several illegible copper coins. Alongside this in the other part of the trench there appears to have been an undisturbed



Site VIII : plan

PLATE



Site VIII : section

Neolithic sequence which produced some fine A ware. The large pit was probably connected with some medieval iron working. However, without further excavation, the almost certainly Neolithic stone platform and the considerable depth of occupation above it must be treated with great caution.

SITE IX

A small cutting was made on the southern rock face of Area A. Bed rock was reached at about 3 feet 9 inches: the whole area was badly pitted and deposits were mixed.

PART II

STUDY OF MATERIALS COLLECTED IN EXCAVATIONS AND FROM SURFACE

I. POTTERY

GENERAL LINES OF STUDY

The study of the pottery from the site is based upon certain assumptions. First is that the pottery of any given period will demonstrate certain coherent and regularly recurring features which will enable us to describe the tradition of the potters of that period and so the potters' industry. Thus it is not essential that every piece described should come from a stratigraphically unequivocal position in order that it should be recognized as belonging to such an industrial tradition. From this it follows that for the reconstruction of the industry, the greater the numbers of samples studied, the more reliable is the reconstruction likely to be. Next, turning to the rôle of pottery in a given society and period, we start with the assumption that the potter was filling a demand when he made his wares and thus that the functional range of his pots must be an answer to the demands of the society. From this follows the second corollary, that for a reconstruction of the functional demands of the society the greater the number of recognizable forms, the greater the likelihood of an accurate picture. The comparative, archaeological importance of a vessel can only be properly estimated when the technical and functional considerations have been stated. Thus our third purpose will be to compare the pottery from the site with comparable assemblages from other sites. In the following pages we shall attempt to differentiate these three aspects, the technological, the functional and the comparative.

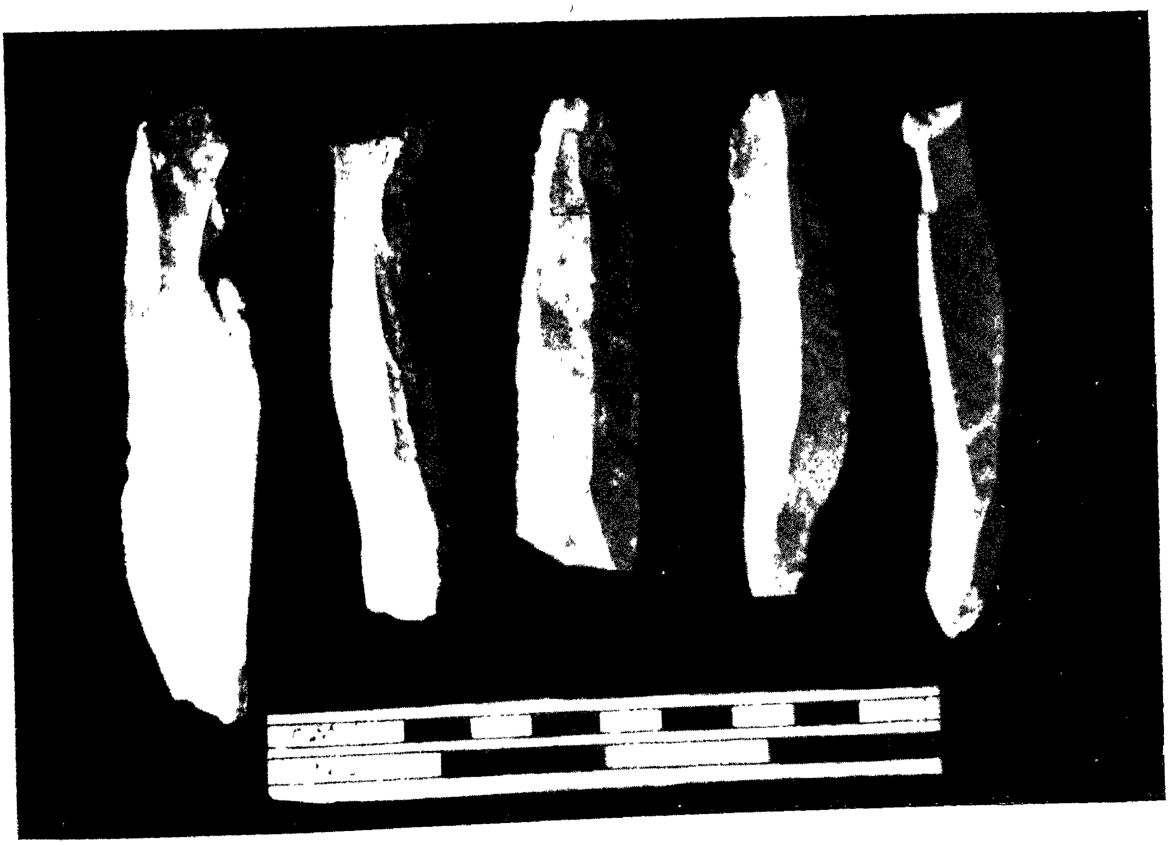
A. THE NEOLITHIC POTTERY COMPLEX (A WARE)

The A ware in its varieties is the pottery of the Neolithic period. The stratigraphic demonstration of this is shown for Site VII and for the remaining sites in Pls. 58 and 59. Within the industrial tradition there are several important variations recognizable which permit us to distinguish the varieties of A ware, A1, A2, etc. Some of these varieties *may* have, in addition to a technical significance, a chronological significance: this will be seen as we proceed.

TECHNOLOGY: BODY CLAY

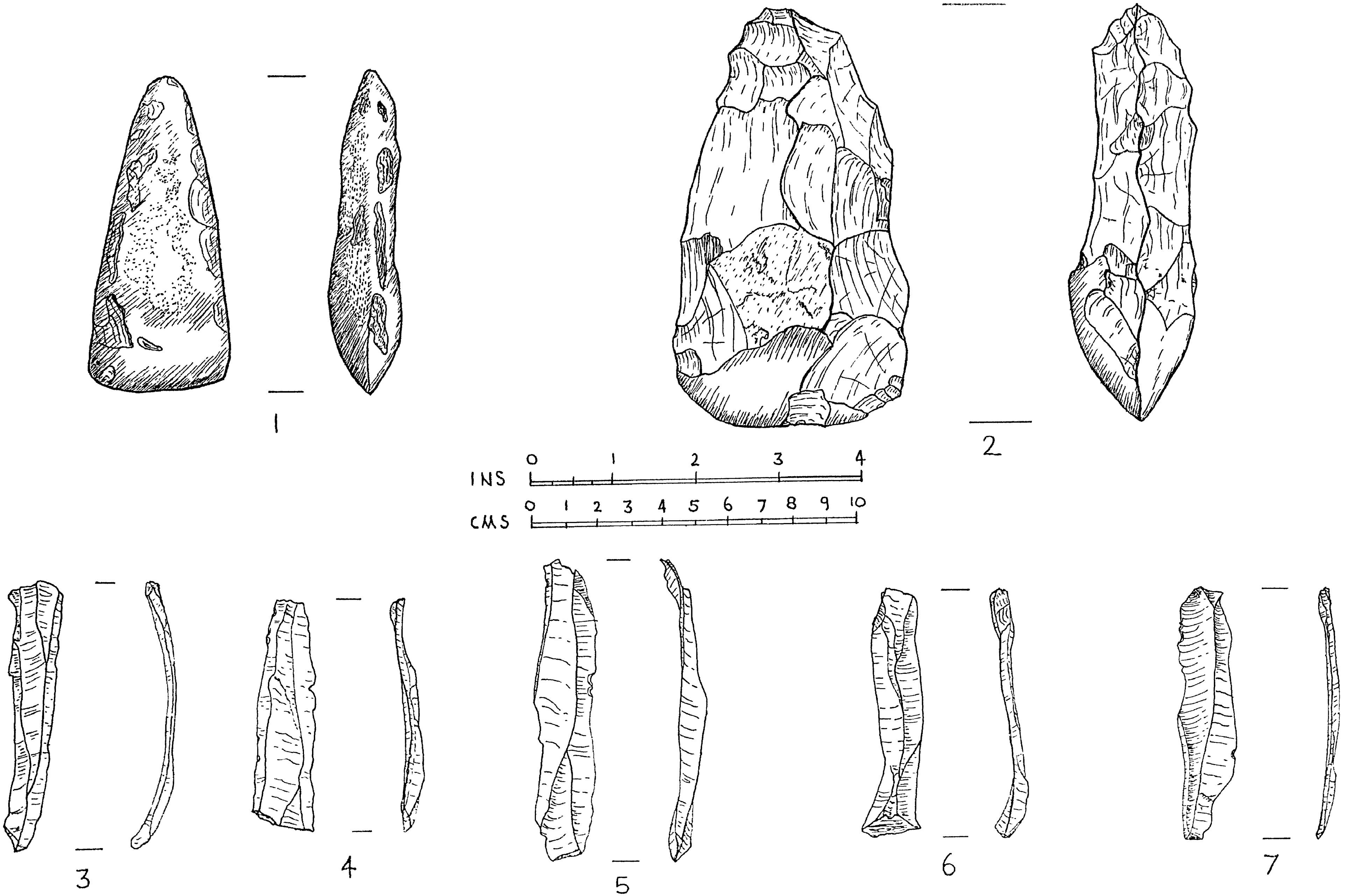
The clay of the majority of the specimens is of a very small particle size with a rare admixture of quartzite or other refractory fragments of larger size. In certain larger vessels, particularly from the Upper Neolithic, there is a more regular admixture of sand or other finer refractories. Towards the end of the period, when the potting tradition suffered a decline, the choice of clay was often less careful than in earlier times. A characteristic feature of the clay chosen for

(*a*) Site VIIIA : burial



(*b*) Site VIIIA : chert blades from burial

PLATE 23



Site VIIIA · axes and chert blades from burial the A wares is that it is micaceous; this feature dominates the entire range of Lower Neolithic wares (A1, 2 and 3), but it is not found in the Upper Neolithic (A4 and 5), which have often a more gritty body, as do the A1 wares which continue into the period. The presence of mica probably puts a ceiling upon the rate of firing as mica is a powerful flux. Indeed, many of the A1–3 wares are distinguished by their low firing and the few fragments of high fired clay from the Lower Neolithic levels do not appear to contain mica. The presence of laminae of mica in the clay favours the tendency which is noticed in a large number of samples of lamination during or after firing. This is particularly noticeable in some of the larger pots. There is no trace of straw or other vegetable addition to the clay as a binding. The source of the clay was not determined but it probably lay in the silt beds of a nearby nulla.

SHAPING

This is no evidence that any of the vessels of the Neolithic industry were wheel-thrown. The characteristic concomitants of wheel-thrown pottery are almost entirely absent, except only in a few doubtful pieces of A4-5 ware which in most cases date from the end of the Upper Neolithic or even post-Neolithic times. A few pots of small size, mainly also dating from the Upper Neolithic, are truly hand-made, but the vast majority show a real degree of competence and regularity in the forming. From an observation of several thousand specimens I infer that two main techniques were in use, the turn-table and the dabber and anvil. The turn-table may have consisted of little more than a large concave sherd in which the round based vessels were rested and rotated during forming. Its use is widely attested in early cultures and its survival in the Mudgal area and elsewhere in India suggests that there too it has a long history. I shall be commenting again upon a survival of its use in connection with the B1 ware. Techniques which employ a combined use of the dabber and turn-table are also widespread in India today. There is evidence in many of the sherds that the dabber was used during forming operations and the dabbers of type 40 (Pl. 28), although all from late or doubtful levels, are all in typical A ware and may well have been employed for this purpose. This beating or dabbing would, incidentally, accentuate the bedding of lamellae in the body clay. Some of the vessels have flat bases, indicating that they were rotated upon a flat turn-table. The often regular marks and finger impressions, etc., on the inner surfaces of vessels, particularly near the rims, are all indicative of the use of the turn-table.

The inner surface of many vessels, particularly those of the A3 ware, shows another interesting feature. They seem to have been scraped, presumably while the clay was leather hard. The scraping has in some cases contributed to the formation of the rim and perhaps to the thinness of the body. In a few cases the scraping may have been done while the pot was put back on to the turn-table, but more commonly the marks are short and irregular and clearly were not made while the pot was rotating. A possible modern analogy to this technique is that reported by Aiyappan among the Uralis of Wynaad.[1]

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[1] *Man* (1947-48), No. 54.

We may notice in passing some of the peculiar shaping processes employed in the A ware:

Handles: Three types are found, knob, lug and loop. The first may be inferred from the broken specimens of types 40*c* and *d* (Pl. 28); it is hand modelled. There are several examples of lug handles, of A2 and 3 wares, cf. types 60 and 61 (Pl. 33), and type 15*a* (Pl. 25); they are also hand modelled and luted on to the body of the vessel when leather hard. There are several examples of loop handles in A2 and 3 wares; both were probably rolled and luted to the body while leather hard, cf. types 62*a* and *b* (Pl. 33), and 23*a* (Pl. 25).

Lips: A number of lips occur. They are made in the same ways as the lugs, or more simply shaped by hand while green hard, cf. types 14*a–d* (Pl. 25).

Spouts: Spouts are more common in A4-5 wares but some do occur in A2. They are mainly made by rolling upon a stick and luting to the leather hard pot but rare specimens are hand modelled.

Channel spout: A single example in A2 painted ware is recorded. It is made in the same way as the lips (type 51, Pl. 31).

Bases: We have already noticed the rounded and flat base. There are three examples of little hollow ring bases, all in A3 ware (types 66, 67 and 69 of Pl. 33), and several other cruder examples were noticed in A2 ware. The ring foot was added to the base probably when leather hard and luted on and the junction is clearly visible. Thus these may be taken to be barbarous imitations of turned feet.

Legged stands: The cylinders appear to have been rolled around a stick, whose diameter may be inferred in some cases from the aperture in the base of the pot, and then luted on to the main body. The hornlike feet were probably luted on later (Pl. 33).

SURFACE TREATMENT

It is mainly by the differences of surface treatment that the varieties of A ware may be recognized. An analysis of about seven hundred sherds from Neolithic levels of Sites I and VII revealed that just less than half bore clear traces of burnish while the remainder were without burnish. Of the burnished group about half were without any surface slip or dressing, while the remainder had two main varieties of dressing. It is upon this basis that the varieties are named: A1, without burnish; A2, with burnish but without slip; A3, with burnish and dressing; A4-5, with burnish and slip.

Burnish.—The burnish seems to have been applied with sticks, bones or pebbles. In open bowls (except in the A3 stands) it is present inside and out, in narrow-necked vessels the inside was generally left unburnished. The insides of the A3 ware stands were scraped. The general direction of the burnish lines is horizontal, but it was applied in short strokes, probably by hand rather than on the turn-table; in some cases the direction is haphazard. More rarely the burnish was applied with such regularity that it formed a pattern, in one case (Pl. 31, No. 51*a*) diagonal but more usually simple horizontal or vertical. The process was completed before firing, probably while the clay was leather hard.

Care should be taken to distinguish this tool burnish of a leather hard pot from the smoothing by hand or cloth of the freshly made vessel. This is more accurately described as smear.

Slip or dressing.—The A3 ware had applied to its surface a thin slip or dressing. It was probably not a slip in the technical sense of the word, but rather a ferruginous oxide, an earthy haematite most probably, ground and mixed with water. This dressing was applied to the surface of the pot before burnishing. In a few cases the burnish was only partly applied or neglected. The A4 and 5 wares were treated in a somewhat different manner. An application seems to have been made to the surface probably at the same time as the burnishing of an organic substance, perhaps including a mucilage or gum. This not only fired in a different manner but produced a distinctive surface very close to that of the B1 ware which was probably treated in a similar way. The precise mineralogic content of the dressing has not been studied, but there is little reason to think that it would differ from that of the local clay used for the body as the traces of organic content would have burnt out.

Incised decoration is found upon a small number of sherds of A1 ware. It is sometimes applied in the form of light scratches in horizontal or diagonal bands, sometimes in herring-bone patterns (Pl. 29*a*). In some cases the application is made with a broad blunt point either lightly applied or deeply. The products of this process are sufficiently distinctive to warrant their being treated as a separate variety which we shall name A1 incised ware.

Surface roughening (*rustication*) is a curious feature which recurs regularly upon vessels of A1 ware. It appears as though when the clay was leather hard the surface was scraped with some abrasive material, perhaps a piece of raw hide, hard dry grass, coarse sand or a piece of roughened wood. It generally appears on the outer surfaces only and is of sufficiently regular occurrence to warrant being treated as a separate variety, A1 surface roughened (rusticated) ware (Pl. 29*a*, No. 3).

Appliqué decoration is found as a rare occurrence. It usually takes the form of simple raised fillets running horizontally around the neck or shoulder of large vessels and luted on to main body so as to take on a triangular section (cf. Pl. 26, No. 33*d* for a complete example, in No. 34*e* of the same plate the scar only remains). In Pl. 32, No. 34*p* is another typical example, while No. 54 of the same plate is combined with finger-tip impressions. A more complex form of *appliqué* decoration, again combined with finger-tip impressions, is to be seen in Pl. 27, No. 37*b*. Finally, we may notice the curious applied vertical ridge of No. 65 of Pl. 33.

Finger-tip impressed decoration occurs usually as a rim decoration of Upper Neolithic or post-Neolithic period storage jars. It is usually in single rows, but occasionally double rows of alternating impressions are met with as well as more complex motifs (cf. Pl. 26, Nos. 36*a* and *b*, and Pl. 27, Nos. 36*c–f*, and 37*a* and *b*).

Perforation.—There is a small group of sherds having perforations, apparently always in the base of the pot. The holes have been pierced with a small stick, generally from the inside towards the out, but also occasionally in the reverse direction. This process was probably done when the clay was green hard (Pl. 29*b*).

FIRING AND THE RESULTS OF FIRING

No direct evidence of the kiln type is available but much may be inferred from the specimens. These show a wide range of firing, from many sherds which were scarcely burnt, to well burnt. This seems to indicate a simple bonfire kiln in which control of firing was strictly limited and over-rapid 'flash' firing a common feature. The A1 and 2 wares show a remarkable range of colours resulting from firing, black, grey, greenish brown, yellow ochre, buff and brick red. Many of the thicker bodies show 'black core' resulting from too rapid firing and insufficient time for oxidation to take place. Blotchiness of surface is another common feature, resulting from uneven atmospheric conditions in the kiln, smoke, etc. The A3 wares with their ferruginous dressing occur, in diminishing frequency, with light red, black, brown ochre, burnt umber and chocolate surface; the body colour varies from red to black or grey. The chocolate is associated with sherds fired to a higher temperature than any others; perhaps they may even be imports, for they are very rare. In the A2 wares the finest quality work is associated with a fine silvery grey or buff which must represent the desired effect. The A1 rusticated ware is usually of a dirty grey-black or brown. The A4-5 wares, as we have already noticed, form a separate group. The characteristic surface colour of the A4 is grey, blackish brown, mottled greenish-orange-grey, occasionally buff. In the A5 there appears to have been an attempt to imitate the red-and-black firing technique of B1 ware. The results vary from a creamy-black contrast, through greenish-black, to buff brown-black. Another frequent variety is grey-black. On large numbers of sherds of the A4-5 group firing has resulted in the development of a surface crackle. This crackle has nothing to do with the European salt glazing technique, and as this term is firmly established in ceramic usage we shall not employ it for these subsidiary effects. The crackle probably results from three factors, the over-rapid shrinkage of the surface dressing during the early stages of firing, the fluxing and shrinking brought about by the presence of the postulated organic matter in the dressing, and the surface fusion which accompanied the firing in many cases. It is probable that the temperature at which the firing took place was higher than that of the A2-3 wares and thus resulted in the surface fusion of particles.

FUNCTIONAL

We have considered the potter's craft as it is revealed by the Neolithic wares from Piklihal. What were the demands in response to which the pots were made? To provide factual evidence of function is often very difficult because, even in comparatively intensively studied cultures—for example the Romano-British, the evidence has never been assembled or analysed critically. Factual evidence in the form of soot deposits on the outsides, charred food remains, etc., has so far not been collected, or if so, it has rarely been used.[1] This is all the more provoking in the Indian context where the great continuity of tradition often enables us to point out the functions of pots of the early historic period with some confidence. But even this help is much less strong when we look back to the little-known Deccan Neolithic culture. We begin therefore by admitting that the results of our labours will do no more than provide a series of hypothetical identifications, that these must await further evidence before they can be regarded as proven. But the attempt is surely worth making, for each one of the fragments must have served some useful purpose and we may even infer what many of these purposes were. We therefore propose the following general functional groups for the A ware and hesitantly suggest the range of functions which any group may have covered.

Functional group	*A ware type numbers*	*Suggested function or functions*
A	1	Shallow platters: service of food, feeding of cattle (?).
B	2, 3, 4, 10, 12	Open bowls, various shapes and sizes: service of food, taking of food, boiling of milk (for *khoā*, etc.).
C	5, 7, 8, 9	Small deep bowls: service of food and liquids, consumption of same.
D	11, 13	Bowls with outcurved rims: (?) eating, (?) cooking.
E	14	Lipped bowls: cooking and service[2] of liquids.
F	15	Lugged bowls: cooking, ritual service (A3 ware).
G	23	Handled pots: ritual service (A3).
H	24	Spouted bowls: preparation of milk and other liquids.
J	42	Hollow-footed cups: drinking, ritual.
K	16, 17, 18	Wide-mouthed jars: carrying water and liquids, as *loṭās*, cooking.
L	19, 20, 21, 52	Open-mouthed jars: milking, holding liquids, cooking.
M	25, 26	Narrow-necked jars, small: storage and carrying of small quantities.
N	27, 55	Similar, medium, including spouted: carriage and service of water, etc.
O	28, 29, 31	Similar, large: water pots, storage.
P	34, 36, 37	Broad-mouthed jars: storage.
Q	38	Bell-shaped jars: (?) storage of liquids.
R	47	Deep-carinated bowl: cooking.
S	40	Discate lids: lids or potter's dabbers.
T	50	Carinated bowls: cooking, eating.
U	51	Channel-spouted bowl: same as E.
V	58	Legged stands: ritual uses.
W	65, 66, 67, 69	Hollow-footed bowls: special uses.
X	–	Perforated pots: steaming, milk boiling, etc.

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[1] Happy exceptions to this are provided by the report on the Arikamédu pottery (*Ancient India*, No. 2), and Sir John Marshall's final report on *Taxila* (Cambridge, 1953).

[2] In many parts of S. India lipped bowls are used for preparing and serving *sāmbar*.

There is a marked division of these functions in the different varieties of A ware. We may illustrate this thus:

Ware	*Functional groups*
A1	A, B, C, D, E, F, G, H, K, L, N, P, Q, S.
A2	A, B, C, D, F, H, J, K, L, M, N, O, Q, T.
A3	B, C, F, V, W.
A1 rusticated	A, B, D, E, K, L.
,, incised	K, R.
A2 painted	B, C, D, K, L, M, O, T, U.
A4	B, C, D, L, M, N, O, U, V.
A5	B, C, D, K, L, M, N, O.

From this table it is apparent that there is a greater diversity of forms in the A1 and 2 wares than in any other. The A4 and 5 appear as later variations of the central range of everyday uses. The A1 rusticated ware appears to be another variant of these practically useful vessels. The incised ware occupies a peculiar and problematic position which requires further explanation. The A2 painted is perhaps a special variation of the standard useful pots. The most unusual pots are those of the A3 range which appear to be largely reserved for special and ritual functions.

A1 AND A2 WARES

The technology of these wares has been already fully discussed. We shall now consider the occurrence of types.

Type 1. These shallow platters are a common occurrence throughout the Neolithic period, in both A1 and 2 wares. A specimen comes from the IA culture at Brahmagiri[1] and another from Maski.[2]

Types	*Ware*	*Provenance*		
Pl. 24, 1*a*	A2 buff	VII	layer	11
b	A1 black and grey, uneven firing	I	,,	7
c	A2 buff and black, patchy	I	,,	12
d	A1 grey	VII	,,	11
e	A1 buff	VIIIA	,,	3
f	A2 buff, fine	VII	,,	6
g	A2 grey/black	VII	,,	8

Type 2. Within this type are collected a wide range of shallow bowls of widely differing sizes. It is probable that they represent a range of different functions. They come from all levels of the Neolithic and even Iron Age. The

extreme lack of standardization of size in these common vessels is probably linked with the absence of the potter's wheel. Comparable types occur at Maski,[1] and at Jorwe.[2]

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[1] *Ancient India*, No. 4, 'Brahmagiri and Chandravalli, 1947', Fig. 19, type T33.

[2] *Ancient India*, No. 13, 'Maski, 1954', Fig. 11, type 11.

Types	*Ware*	*Provenance*		
Pl. 24, 2*a*	A1 buff	VII	layer	11
b	A2 grey (approaching A4)	VII	,,	6
c	A2 buff/grey, black burnish inside	VII	,,	4
d	A1 grey	VII	,,	8
e	A2 grey/black	VII	,,	6
f	A2 buff black, patchy	I	,,	12
g	A2 grey	VII	,,	4
h	A2 grey	VIIIA	,,	2
j	A2 buff	VII	,,	4
k	A2 grey	VII	,,	8
l	A2 grey	VIIIA	,,	2

Type 3. A variant upon type 2. The only stratified example comes from the Upper Neolithic. Compare Maski.[3]

Types	*Ware*	*Provenance*		
Pl. 24, 3*a*	A1 grey/brown	VII	layer	0
b	A2 brown	VII	,,	7

Type 4. This type includes a wide range of bowls, rather steeper sided than the two preceding types. It is common in the Upper Neolithic and survives into the Iron Age. Compare Brahmagiri.[4]

Types	*Ware*	*Provenance*		
Pl. 24, 4*a*	A2 buff	VIIIA	layer	2
b	A2 grey	VII	,,	9
c	A2 grey/black	VIIIA	,,	3
d	A1 buff	VII	,,	7
e	A2 grey, very coarse sherd	VII	,,	9
f	A1 grey, coarse	VII	,,	4
g	A2 buff	VII	,,	9
h	A1 black/grey coarse	VII	,,	7
j	A2 pale grey and black, burnished inside only	VII	,,	5

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[1] *Ancient India*, No. 13, 'Maski, 1954', Fig. 11, type 8.

[2] Sankalia, H. D., and Deo, S. B.: *Excavations at Nasik and Jorwe* (Poona, 1955), Fig. 77, type 126.

[3] *Ancient India*, No. 13, *loc. cit.*, Fig. 11, type 8*a*.

[4] *Ancient India*, No. 4, *loc. cit.*, Fig. 22, type T66.

Type 5. This is the first of several types of small deep bowls. These also occur only in the Upper Neolithic and later. They were probably used for eating and drinking. Compare Brahmagiri,[1] Maski[2] and Nasik.[3]

Types	*Ware*	*Provenance*	
Pl. 24, 5*a*	A1 buff	VI	layer 5
b	A1 grey	VII	,, 8
c	A2 grey	VII	,, 5
d	A2 grey	VII	,, 4
e	A1 buff/grey	VII	,, 0
f	A2 grey/black	VII	,, 9

Type 6 is the base of a comparable bowl to type 5.

Types	*Ware*	*Provenance*	
Pl. 24, 6	A1 very roughly made, grey	VII	surface

Type 7. A variant of type 5. Compare Brahmagiri.[4]

Types	*Ware*	*Provenance*	
Pl. 24, 7*a*	A2 grey/black mottled	VI	layer 1
b	A2 grey/black	VII	,, 0

Type 8. A small variant of type 5. Compare Brahmagiri,[5] Nasik.[6]

Types	*Ware*	*Provenance*	
Pl. 24, 8	A2 pale grey/black patches	VII	layer 5

Type 9. Another variant of type 5 with incurving sides. This little bowl resembles a type of the red-and-black B1 ware. It only occurs in the Upper Neolithic. Compare Brahmagiri.[7]

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[1] *Ancient India*, No. 4, *loc. cit.*, Fig. 20, type T36*a*.

[2] *Ancient India*, No. 13, *loc. cit.*, Fig. 11, type 8*b*.

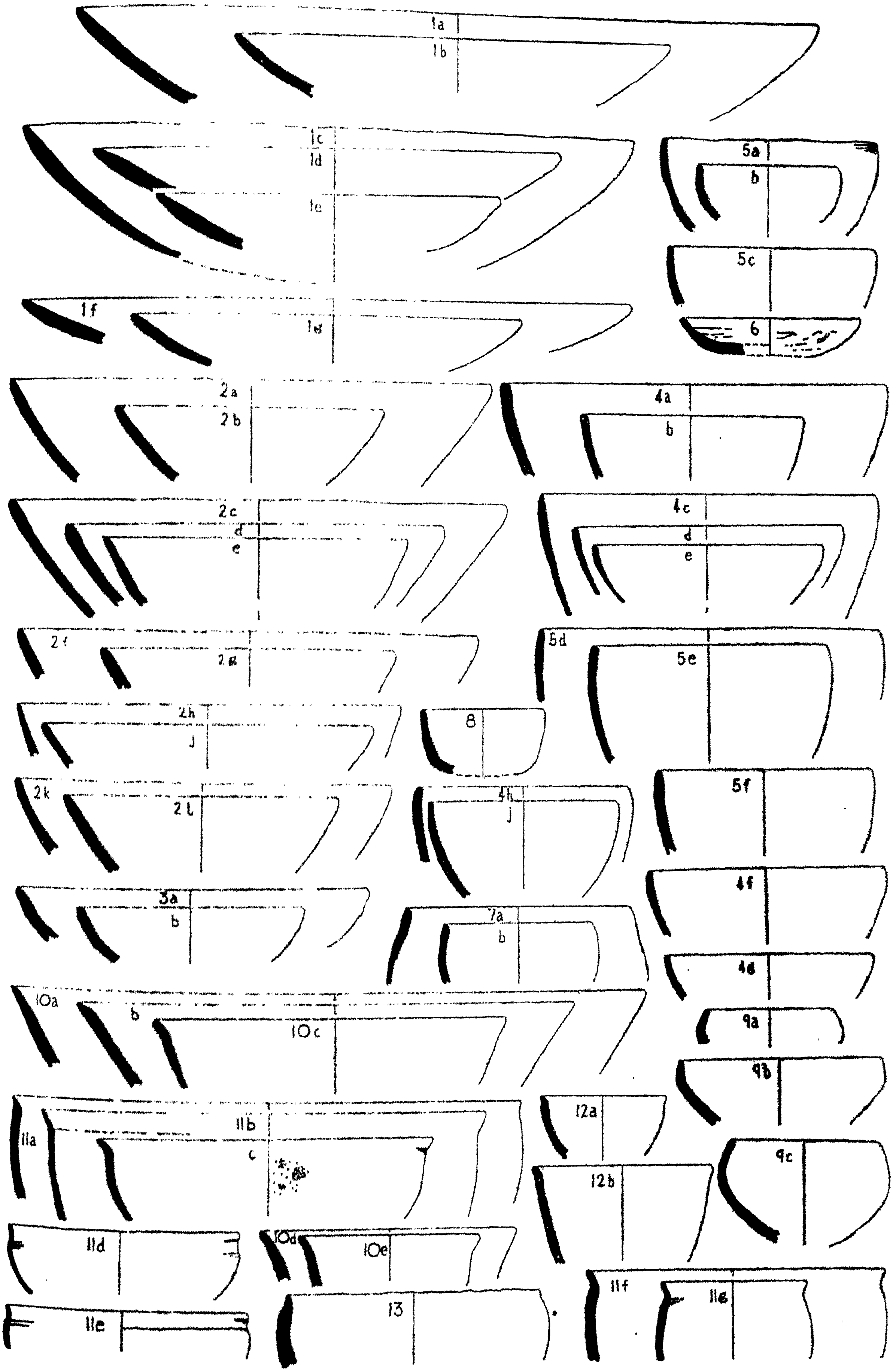
[3] Sankalia and Deo, *loc. cit.*, Fig. 4, a.

[4] *Ancient India*, No. 4, *loc. cit.*, Fig. 22, T61; Fig. 23, T71.

[5] *Ibid.*, Fig. 23, T72.

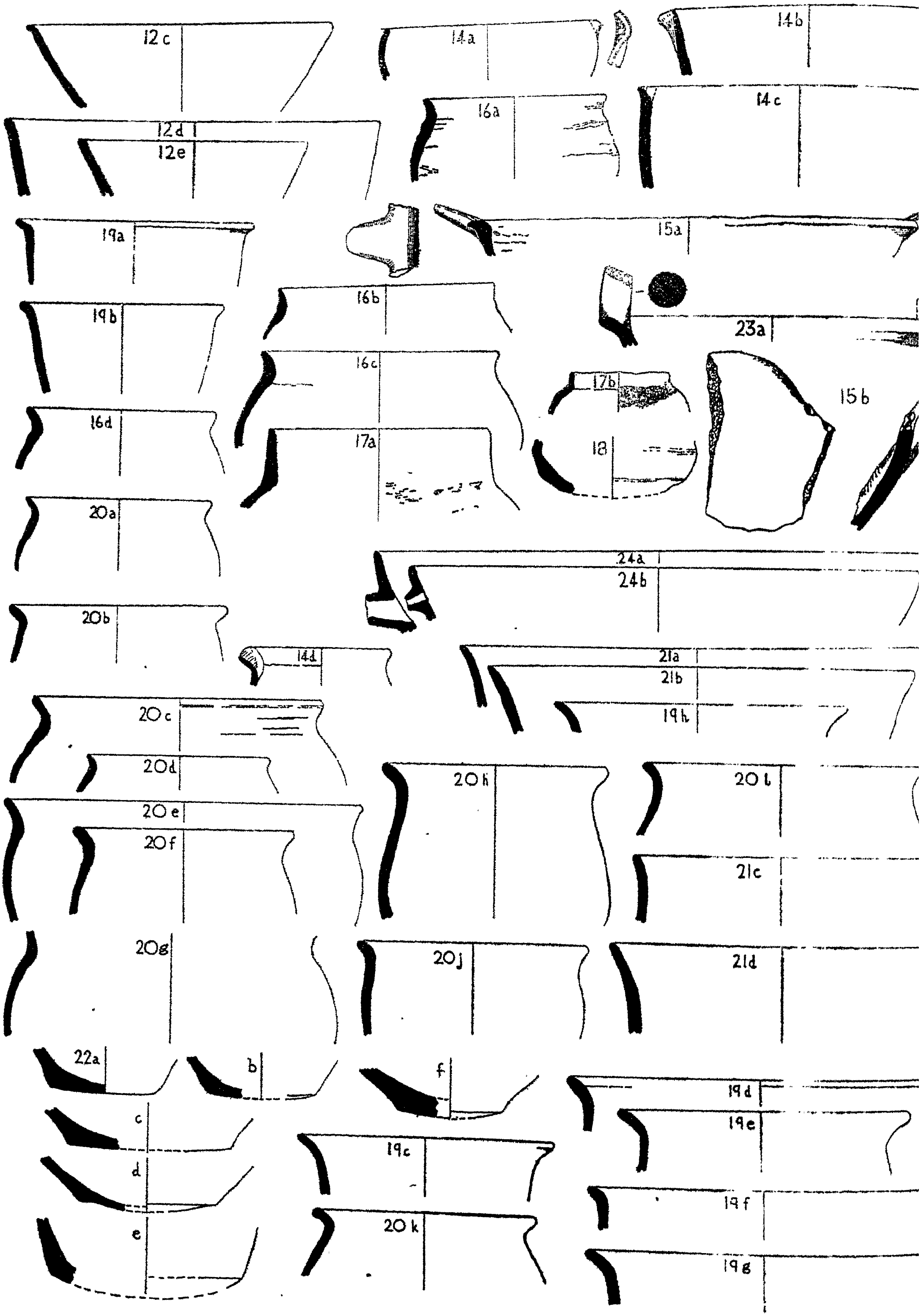
[6] Sankalia and Deo, *loc. cit.*, Fig. 4, f.

[7] *Ancient India*, No. 4, *loc. cit.*, Fig. 22, T60.



Pottery: A1 and 2 wares (scale 1 : 4)

PLATE



Pottery: A1 and 2 wares (scale 1 : 4)

Types	*Ware*	*Provenance*
Pl. 24, 9a	A2 orange/buff	VII layer 9
b	A1 grey	VII ,, 5
c	A2 olive green/grey	VII ,, 6

Type 10. This is a variant of type 2, distinguished by a slightly out-turned rim. Compare Jorwe.[1]

Types	*Ware*	*Provenance*
Pl. 24, 10a	A2 grey	VII layer 5
b	A2 buff	VII ,, 11
c	A1 grey/black patches	VI ,, 1
d	A2 buff	VII ,, 8
e	A2 buff	VI ,, 1

Type 11 is a variety of bowl with slightly out-turned rim, occurring in a wide range of sizes, probably covering several different functions. Comparable forms occur at Brahmagiri[2] and are common at Maski.

Types	*Ware*	*Provenance*
Pl. 24, 11a	A2 grey/black	VIIIB layer 7
b	A1 very fine clay and ware	VIIIB ,, 7
c	A2 grey	VII ,, 9
d	A1 very rough clay	VIIIB ,, 5
e	A2 grey	VII ,, 7
f	A2 brown, approaching A4	VII ,, 5
g	A2 grey	VIIIB ,, 7

Type 12 is yet another of the open bowl types, distinguished by its slightly out-turned rim, found mainly in the Upper Neolithic. Comparable forms occur at Brahmagiri, Maski and Jorwe.

Types	*Ware*	*Provenance*
Pl. 24, 12a	A2 black/grey	VII layer 5
b	A2 grey/buff	VI ,, 5
Pl. 25, 12c	A1 brown, very poor work	VII ,, 5
d	A1 buff	VII ,, 11
e	A2 buff, coarse clay	VII ,, 6

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[1] Sankalia and Deo, *loc. cit.*, Fig. 77, type 120.

[2] *Ancient India*, No. 4, *loc. cit.*, Fig. 21, T45.

Type 13 is a unique variant of type 11. Compare Sanganakal.[1]

Types	*Ware*	*Provenance*	
Pl. 25, 13	A1 buff, coarse, hand-made	VIIIB	unstratified

Type 14 includes lipped bowls of several forms all of A1 ware. These come from both the Lower and Upper Neolithic and are a characteristic feature of the A ware. Compare examples from Sanganakal.[2]

Types	*Ware*	*Provenance*	
Pl. 25, 14*a*	A1 buff, coarse clay	VII	layer 5
b	A1 buff, coarse clay	VII	,, 9
c	A1 buff/black	I	unstratified
d	A1	VII	layer 11

Type 15 includes lugged bowls. These are also characteristic of the Neolithic. Similar lugs occur at Sanganakal[3] and Maski.[4] They are found also at Piklihal in A3 red ware (below).

Types	*Ware*	*Provenance*	
Pl. 25, 15*a*	A2 coarse grey clay	VII	layer 7
b	A1 soot on outer surface, cooking	VII	,, 9

Type 16 is the first of a group of wide-mouthed vessels which may well have been used for carrying liquids, performing the multifarious uses of the *loṭa*, and perhaps for cooking. Almost the whole series are in coarse A1 ware, but the type seems to have had a long life and gone through the whole Neolithic into the Iron Age. Comparable pots occur at Maski,[5] and related forms at Jorwe.

Types	*Ware*	*Provenance*	
Pl. 25, 16*a*	A1 buff	VI	layer 5
b	A1 buff/black	VII	,, 10
c	A1 grey/black	VII	,, 2
d	A1 dark grey, coarsely made	VII	,, 1

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[1] Subbarao, B.: *Stone Age Cultures of Bellary* (Poona, 1948), Pl. VIII, type XV.
[2] *Ibid.*, types XV c and d.
[3] *Ibid.*, Pl. VII, type XVI.
[4] *Ancient India*, No. 13, *loc. cit.*, Fig. 10, *2a*.
[5] *Ibid.*, Fig. 10, *1d*.

Type 17 is probably a variant of type 16, the ware of the two specimens is also A1, the workmanship coarse: Upper Neolithic, related forms occur at Jorwe.

Types	*Ware*	*Provenance*		
Pl. 15, 17*a*	A1 grey, coarse	VII	layer	4
b	A1 grey, rough coarse body	VII	,,	6

Type 18 is probably the lower part of a vessel of type 17, represented by a single piece.

Types	*Ware*	*Provenance*		
Pl. 25, 18	A1 grey, rough coarse body	VII	layer	7

Type 19 is the first of a group of open-mouthed jars, often of better workmanship than the preceding group and possibly used for milking pails. No complete example is known and it is not possible to be certain of the exact form. Occurs Upper Neolithic to Iron Age.

Types	*Ware*	*Provenance*		
Pl. 25, 19*a*	A1	VIIIB	layer	4
b	A2 buff	VI	,,	5
c	A2 buff, finely made	VII	,,	4
d	A1 buff and grey	VII	,,	5
e	A1 buff	VII	,,	6
f	A2 buff	VII	,,	6

Type 20 is another of the same group, including a variety of open-mouthed pots, some wider and some deeper, but nearly all well made and sometimes carefully burnished inside. It appears that they were used for milking, carrying and storing liquids, etc. The type persists from Lower Neolithic into Iron Age level. Somewhat similar forms occur at Maski and Brahmagiri; Sanganakal has a close parallel,[1] so does Jorwe.[2]

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[1] Subbarao, *loc. cit.*, Pl. VIII, type VI.
[2] Sankalia and Deo, *loc. cit.*, Fig. 76, type 118*a*.

Types	*Ware*	*Provenance*
Pl. 25, 20*a*	A2 burnished on inside	VII layer 5
b	A1 buff	VII ,, 9
c	A1 type ware but traces of burnish inside	VI ,, 5
d	A1 buff	VII ,, 6
e	A2 grey	VIIIA ,, 3
f	A1 buff/grey	VIIIB ,, 3
g	A2 grey	VII ,, 9
h	A1 black/buff	VII ,, 6
j	A2 black/grey with fine vertical burnish	VII ,, 6
k	A1 black/buff	I ,, 2
l	A2 buff	VI ,, 5

Type 21 is a somewhat larger and coarser version of type 20. The form is probably that of some of the Brahmagiri burial urns,[1] but no complete specimens were found at Piklihal.

Types	*Ware*	*Provenance*
Pl. 25, 21*a*	A1 buff	VII layer 8
b	A1 buff	I ,, 7
c	A2 grey-black, approaches A4	VII ,, 6
d	A1 grey	VII ,, 6

Type 22 includes characteristic bases of the Neolithic period. There can be little doubt that they should be associated with the foregoing types. Similar bases occur at Sanganakal.[2] While many are flattened a high proportion have a slight roundness. This probably arises from the concavity of the sherd, etc., employed as a turn-table during manufacture.

Types	*Ware*	*Provenance*
Pl. 25, 22*a*	A2 grey	I layer 12
b	A2 orange/red	VII ,, 9
c	A1 grey	VII ,, 7
d	A2 grey, approaching A4	VII ,, 4
e	A1	VII ,, 5
f	A1 grey/black	VII ,, 9

Type 23 is a rare but recurring type of handled pot. The specimen illustrated is not complete and the body of the pot is not known, probably it was a variety

of type 52 below. The nature of the ware suggests that this might be a very late Neolithic survival of the A3 red ware. No comparable forms are known to me.

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[1] *Ancient India*, No. 4, *loc. cit.*, Fig. 20, T36.

[2] Subbarao, *loc. cit.*, Pl. VIII, type XIII.

Types	*Ware*	*Provenance*	
Pl. 25, 23	A1 buff/red surfaced	I	unstratified

Type 24. These spouted bowls are rare but very distinctive; they were probably used in milk preparation. Neither of the specimens comes from Neolithic levels but both are in typical ware and as analogues occur at Brahmagiri[1] and Jorwe[2] it seems safe to accept them.

Types	*Ware*	*Provenance*	
Pl. 25, 24*a*	A2 buff/black	Area B	surface
b	A1	VII	layer 0

Type 25 is the first of a series of types in which the neck is small in relation to the belly. The resulting pots were probably used for the carrying and storage of water and other liquids and also perhaps of grains, etc. Once again we may note that the majority of the vessels have been carefully burnished, probably to reduce the porosity of the clay. The type is most common in the Lower Neolithic. Compare Brahmagiri,[3] Jorwe.[4]

Types	*Ware*	*Provenance*	
Pl. 26, 25*a*	A2 grey	VII	layer 9
b	A2 grey	VII	,, 10
c	A2 grey	VII	,, 10
d	A2 buff	VI	,, 5
e	A2 grey	VII	,, 9

Type 26 is a belly of a vessel similar to type 25.

Types	*Ware*	*Provenance*	
Pl. 26, 26	A2 grey	VII	layer 5

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[1] *Ancient India*, No. 4, *loc. cit.*, Fig. 19, T34.

[2] Sankalia and Deo, *loc. cit.*, Fig. 68, No. 50.

[3] *Ancient India*, No. 4, *loc. cit.*, Fig. 22, T50.

[4] Sankalia and Deo, *loc. cit.*, Fig. 69, No. 53.

Type 27 is a common rim for a medium-sized vessel of the same series. It occurs in both Lower and Upper Neolithic, and perhaps also spouted (cf. type 44 below). It is particularly common in A4-5 ware (q.v.). The functional relationship of this type to 28 is not clear. Compare Brahmagiri,[1] Maski[2] and particularly Jorwe.[3]

Types	*Ware*	*Provenance*	
Pl. 26, 27*a*	A1 buff	VI	layer 5
b	A1	VII	,, 10
c	A2 buff	VII	surface
d	A2 grey	VII	layer 9
e	A2 grey	VII	,, 9
f	A2 buff	VII	,, 11

Type 28 is a yet larger rim of plain type from a vessel which must also have been used for carrying and storing water. Complete specimens occur at Brahmagiri.[4] It is found only in A2 ware and is often finely burnished. It seems to have persisted from the Lower Neolithic to the end of the period. Compare also Sanganakal[5] and Jorwe.[6]

Types	*Ware*	*Provenance*	
Pl. 26, 28*a*	A2 grey	VII	layer 6
b	A2 grey	VII	unstratified
c	A2 grey, regular burnish strokes	I	layer 12
d	A2 buff	VII	,, 6

Type 29 is a variant of 28 made with very thin body and careful finish. Compare Sanganakal[7] and Jorwe.[8]

Types	*Ware*	*Provenance*	
Pl. 26, 29*a*	A2 grey	VII	layer 9
b	A2 grey/black (approaching A5 ware)	VII	,, 8
c	A2 grey	VIIIB	,, 7
d	A2 grey	VII	,, 8
e	A2	VII	,, 10
f	A2 buff	VII	,, 6
g	A2 grey	VIIIB	,, 4

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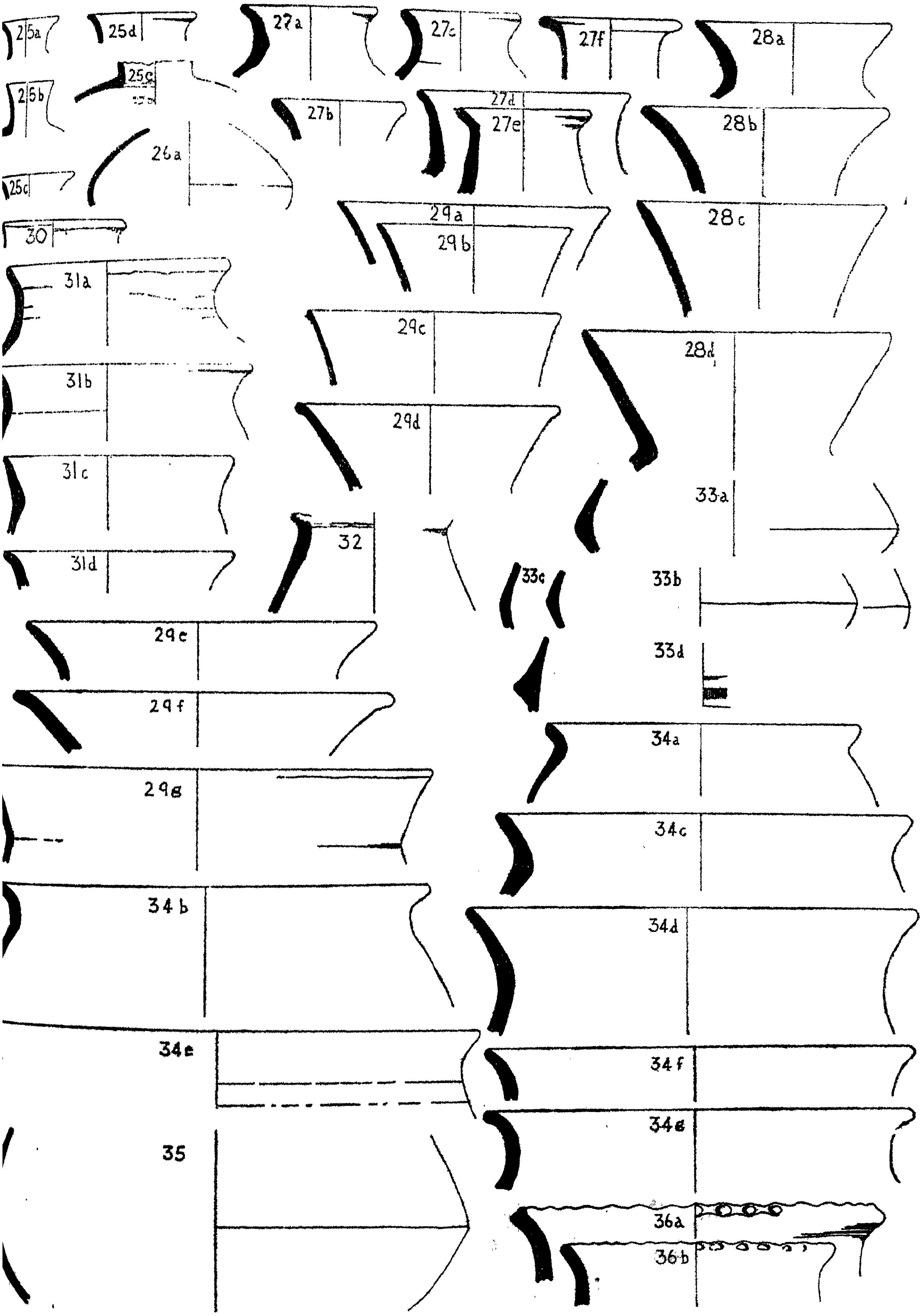
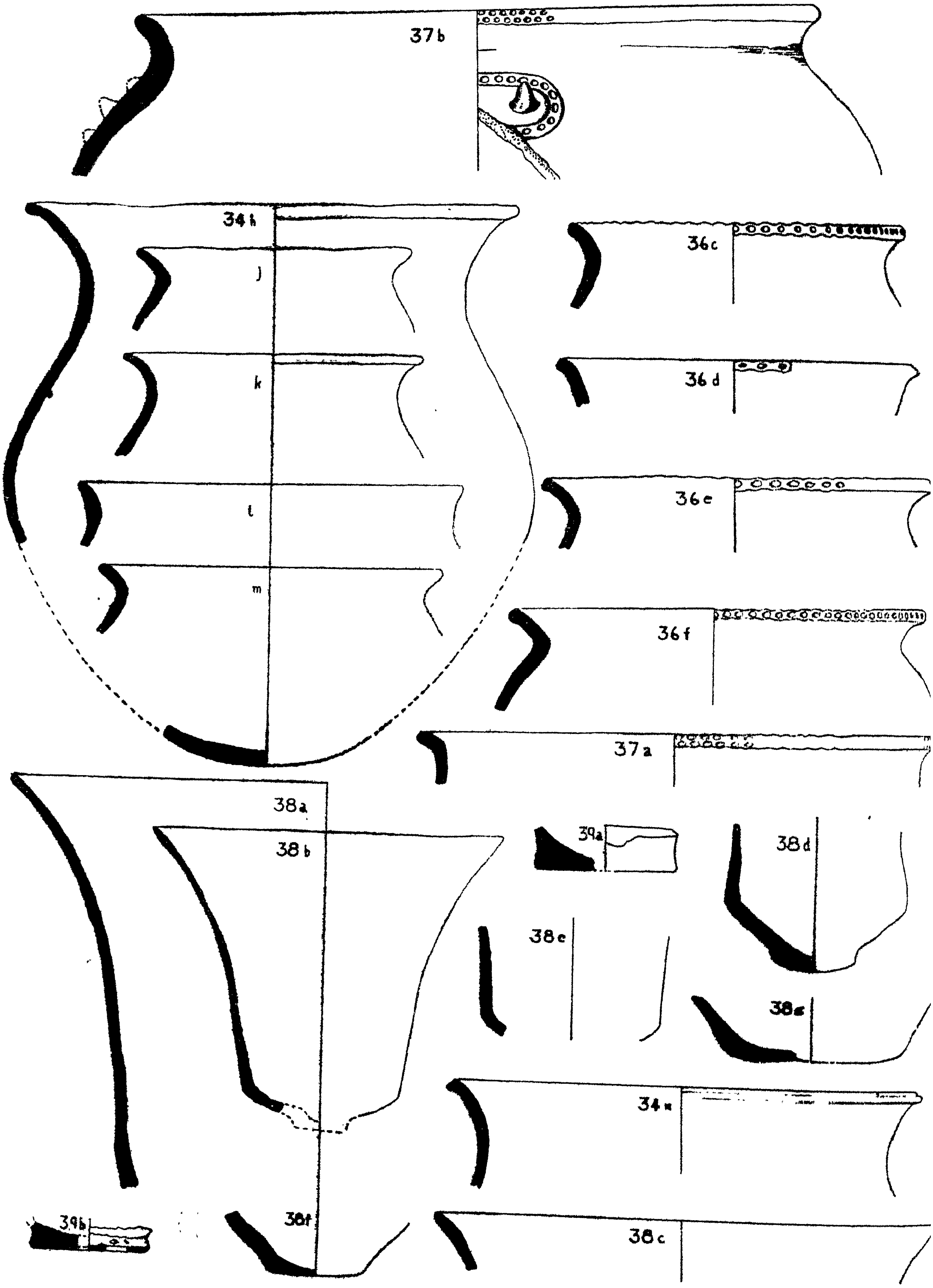
[1] *Ancient India*, No. 4, *loc. cit.*, Fig. 22, type T51.
[2] *Ancient India*, No. 13, *loc. cit.*, Fig. 12, type 29.
[3] Sankalia and Deo, *loc. cit.*, Fig. 69, Nos. 54–57.
[4] *Ancient India*, No. 4, *loc. cit.*, Fig. 20, T42.
[5] Subbarao, *loc. cit.*, Pl. IX, type XIX.
[6] Sankalia and Deo, *loc. cit.*, Fig. 69, Nos. 61, 62.
[7] Subbarao, *loc. cit.*, Pl. IX, XIX k.
[8] Sankalia and Deo, *loc. cit.*, Fig. 69, No. 59.



Pottery: A1 and 2 wares (scale 1 : 4)



Pottery: A1 and 2 wares (scale 1 : 6)

Type 30 is a unique form of rim from the Upper Neolithic which appears to have been wheel-thrown (this also unique). Perhaps the pot should rather belong to the AB ware (q.v. below, p. 58). Compare rim of Brahmagiri[1] and rims from Maski graves of class B(1).[2]

Types	*Ware*	*Provenance*
Pl. 26, 30	A1 buff, (?) wheel-thrown, unique	VII layer 6

Type 31 is a variant of type 29 with wider mouth and shorter rim. The type occurs in the Upper Neolithic. It is common at Brahmagiri, Sanganakal, and Jorwe.

Types	*Ware*	*Provenance*
Pl. 26, 31*a*	A2 brown/grey blotchy	VII layer 8
b	A1 black/grey	I „ 7
c	A1 grey	VII „ 7
d	buff on black body	I surface

Type 32 is apparently the shoulder of type 29.

Types	*Ware*	*Provenance*
Pl. 26, 32	A1 buff and grey	VII layer 5

Type 33 is apparently the side of types 28 and 29.

Types	*Ware*	*Provenance*
Pl. 26, 33*a*	A2 buff/brown	VII layer 0
b	A2 grey	VII „ 7
c	A2 buff	VII „ 4
d	A1 brown	VII „ 9

Type 34 is the first of several types of broad-mouthed jars probably used for storage purposes. They are generally in A1 ware, only rarely in A2, and come from all levels including post-Neolithic. Such jars occur at Sanganakal,

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[1] *Ancient India*, No. 4, *loc. cit.*, Fig. 17, No. 12.

[2] *Ancient India*, No. 13, *loc. cit.*, Fig. 15, Nos. 8, 9, 11.

Maski, Brahmagiri, and with slight variation Jorwe and Bahal. Compare 34 with examples from Maski,[1] and from Jorwe[2].

Types		*Ware*	*Provenance*	
Pl. 26, 34*a*		A1 buff/black	VII	layer 5
	b	A1 buff	VII	,, 7
	c	A1 buff	VII	,, 9
	d	A1 buff with black inner surface	I	surface
	e	A2 grey with scar of *appliqué* fillet	VIIIA	layer 4
	f	A1 buff	VII	,, 6
	g	A1 buff	VII	,, 6
Pl. 27	*h*	A1 buff/black, from storage pit in	VII	,, 6
	j	A2 buff/grey	VII	,, 11
	k	A1 buff, red surface	I	,, 3
	l	A1 buff outer, black inner surface	I	surface
	m	A1 buff	VII	layer 6
	n	A1 buff/black	VIII	surface

Type 35 is the body of a large jar of type 34.

Types	*Ware*	*Provenance*	
Pl. 26, 35	A2 buff/black	VII	layer 6

Type 36 is another common variant of type 34 in which the rim is decorated by a series of finger- or thumb-tip impressions in single rows. The type occurs throughout the Upper Neolithic and in post-Neolithic levels. Similar forms are reported at Sanganakal,[3] and closely related forms at Jorwe,[4] where the decoration is a regular feature. It appears also at Maski[5] in Iron Age graves of class B(1).

Types		*Ware*	*Provenance*	
Pl. 26, 36*a*		A1 buff/black, with finger-tip decorated rim	.. VII	layer 7
	b	A1 buff/black, ,, ,, ,,	.. VII	,, 9
Pl. 27	*c*	A1 .. ,, ,, ,,	.. VIIIB	unstratified
	d	A1 .. ,, ,, ,,	.. VII	layer 4
	e	A1 .. ,, ,, ,,	.. VII	,, 2
	f	A1 .. ,, ,, ,,	.. VII	,, 6

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[1] *Ancient India*, No. 13, *loc. cit.*, Fig. 12, No. 21.

[2] Sankalia and Deo, *loc. cit.*, Fig. 72, No. 85 and Fig. 73, No. 89

[3] Subbarao, *loc. cit.*, Pl. VII, type VII u–w.

[4] Sankalia and Deo, *loc. cit.*, Fig. 71.

[5] *Ancient India*, No. 13, Fig. 16.

Type 37 is a variant of type 36 with a double row of thumb-tip impressions on the rim. It appears at the end of the Neolithic and later. *37b* has an additional decorative motif with a small boss of *appliqué* clay and an *appliqué* band with finger-tip decoration applied. Compare Sanganakal,[1] and in general Jorwe.

Types	*Ware*	*Provenance*	
Pl. 27, 37*a*	A1 buff/black	VII	layer 6
b	A1 ,, ,,	VII	,, 0

Type 38 is a unique series of bell-shaped jars of unknown function. No complete specimen was found but the reconstruction of *38a* and *b* allows little room for doubt that this was the original form. The jars are characterized by a double curve or shoulder at the base, perhaps to make them stand steadily in a ring stand. Some examples have careful burnish on the inside and out; all appear to have been built up in segments and beaten into shape. Lower Neolithic.

Types	*Ware*	*Provenance*	
Pl. 27, 38*a*	A1-2 buff pink with traces of burnish in horizontal direction	I	layer 12
b	A2 orange brown with horizontal burnish outside and vertical inside	I	,, 12
c	A1 buff/black rim of similar jar	VII	,, 9
d	A1-2 blotchy grey, black, buff, with traces of horizontal burnish inside	I	,, 12
e	A2 similar ware, another vessel	I	,, 12
f	A1-2 ware, similar to 38*a*	I	,, 12
g	A1 buff/red	VII	,, 6

Type 39 are bases of another form, one is flattened and has a rough bevelling around the lower angle. They are both from late contexts.

Types	*Ware*	*Provenance*	
Pl. 27, 39*a*	A1 very coarse	VII	layer 6
b	A1 buff/grey	VII	,, 4

Type 40 are discate lids and/or potters' dabbers. The possible association of these tools with the potter's craft has been mentioned above. Only one of the specimens listed actually comes from a Neolithic level, but all are in A1 ware.

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[1] Subbarao, *loc. cit.*, Pl. VII, No. 2.

However, closely similar objects occur at Sanganakal,[1] Maski,[2] and in surface collections in Raichur, and there seems to be no reason to doubt their association with the Neolithic.

Types	*Ware*	*Provenance*	
Pl. 28, 40*a*	A1 grey/black, coarse		surface
b	A1 buff, with loop handle	VIII	unstratified
c	A1 buff	VII	layer 6
d	A1 grey, very rough	VII	,, 5

Type 41 is a unique very coarsely made vessel with a scar on its outer face apparently indicating the position of a now missing handle. Although this piece comes from an immediately post-Neolithic level the fabric suggests that it is in the Neolithic tradition. The outer surface has traces of fire blackening, indicating its probable use as a cooking pot.

Types	*Ware*	*Provenance*	
Pl. 28, 41	A1 buff and grey, hand-made	VII	layer 5

Type 42 is a unique fragment from what appears to have been a hollow-footed cup of A2 ware. Its identification would have been less easy had it not compared with a fragment from Brahmagiri in A2 painted ware.[3] Together these two specimens recall the 'footed chalices' of Shah Tepe, etc.[4]

Types	*Ware*	*Provenance*	
Pl. 28, 42	A2 buff, from hollow-footed cup or bowl	VII	layer 9

Type 43 includes a number of little feet from large vessels of unknown form. These specimens all come from Neolithic levels but many more were found on the surface. No comparable forms have so far been reported in Neolithic sites in the Deccan.

Types	*Ware*	*Provenance*	
Pl. 28, 43*a*	A1 buff and black	VII	layer 11
b	A1 buff and grey	VII	,, 9
c	A1 with traces of rough red dressing	VII	,, 7

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[1] Subbarao, *loc. cit.*, Pl. VII, type VIII.

[2] *Ancient India*, No. 13, *loc. cit.*, Fig. 11, Nos. 16, 18.

[3] *Ibid.*, No. 4, *loc. cit.*, Fig. 23, T74.

[4] Arne, T. J.: *Shah Tepe* (Stockholm, 1945), p. 200, Fig. 399.

Type 44 includes spouts of A2 (?4) ware. These spouts are probably to be associated with type 27 above, on the analogy of the A4 and 5 ware, type 55. However, as no complete examples were found they have been listed separately. Such spouts are common occurrences at Neolithic sites in the Deccan. Compare their occurrences at Nevasa, Jorwe, and other sites of Mahārāshtra, Malwa, etc., Upper Neolithic and later: no specimens are known from the Lower Neolithic at Piklihal.

Types	*Ware*	*Provenance*	
Pl. 28, 44*a*	A2 buff brown, fine clay	VIIIA	unstratified
b	A ware, grey	VII	layer 0
c	A ware, grey	VII	,, 1
d	A2 spout of grey and black ware	VII	,, 5
e	A2 spout, grey	VII	,, 6

A1 PERFORATED WARE

Type 45. The perforated sherds are a regular occurrence at all Neolithic sites so far excavated. They have always been fragmentary so that it has not been possible to discover the form of the vessels of which they formed part. However, at Piklihal some of the fragments are large enough to suggest that it was only in the centre of the base of round-bellied pots that the perforations were pierced. A careful comparison of the size and fabric of the pieces with the other examples of A1 ware seems to indicate that if, as we have reason to expect, the other parts of the whole vessels have been found although not recognized, then they will belong to the functional group K or L (i.e. type 16, 17, 20 or 21). At Piklihal they occur more commonly in the Upper than Lower Neolithic. The use to which these perforated vessels may have been put is hard to determine. They could be in connection with the burning of incense, i.e. as braziers. This would be supported by the modern use of perforated pots in this fashion in parts of Madras, Andhra Pradesh and Mysore. Alternatively they could be used as covers for milk boiling, in the fashion which I have seen the *jhāpā* or *jhāvā* perforated covers used by the Jats around Gurgaon. A third possible use is as an *iddali pātram* for the steaming of cereal products, *iddali*, or *dhokrā*, in the manner still widely practised in southern and western India.[1] (*See also* Pl. 29*b*.)

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[1] The tall cylindrical perforated vessels of the Indus valley sites, including Lothal, seem functionally more suited as braziers for incense, etc., than anything else. The Piklihal perforated bases are clearly derived from vessels of a different form. They do not seem to have been footed braziers of the sort reported in Hissar III (Schmidt, E.: *Excavations at Tepe Hissar*, Pls. XXXVI, XLIII, etc.), or at Turang Tepe (Wulsin, F. R.: 'Excavations at Turang Tepe', Suppl. to *Bull. Amer. Inst. for Persian Art and Archy.* (1932)). Rather they may be associated with the perforated bowls of Shah Tepe (Arne, *loc. cit.*, p. 212) and with the recently reported examples from sites in Dagestan, particularly from Madau Depe I (Masson, V. M.: 'Monuments of the Cultures of Archaic Dagestan', *U.T.A.K.E.*, VII, Ashkabad (1956), Fig. 45, etc.). If, indeed, the Piklihal perforated vessels belonged to such bowls, and this is perfectly compatible with their size and shape, then they would probably have been used as other things than braziers, perhaps as milk-steaming lids, or for some kind of cooking.

Types	*Ware*	*Provenance*	
Pl. 28, 45*a*	A1 rounded base	VII	layer 8
b	A1 buff, part of base	VIIIB	,, 5
c	A1 buff, ,, ,, ,, ...	VII	,, 5
d	A1 buff	I	,, 7
e	A1 buff	VII	,, 6

(*See also* type 46 below.)

A1 Incised Ware

The incised ware is also a persistent, if rare, occurrence in Neolithic assemblages in the Deccan. At Brahmagiri it was found only in the IA culture; at Maski, throughout period I. At Piklihal it is found in both Lower and Upper Neolithic. Its affinities with the incised sherds from Jorwe[1] and other sites is still obscure. At Piklihal only two recognizable forms occur, the one is of type 20, the other a new type (47) apparently a bowl with deep sides and carination. The incised pattern occurs either in the form of straight horizontal lines, diagonal lines or herring-bone bands. (*See* Pl. 29*a*.) The actual fabric of the examples is also somewhat unusual: it occurs in both unburnished and burnished clay and in two cases unburnished clay with traces of red dressing. Thus the description A1 is perhaps not strictly applicable. On the other hand it more generally fits the examples than any other.

Types	*Ware*	*Provenance*	
Pl. 28, 20*x*	A1 grey/black, with diagonal incised lines and traces of surface roughening	VII	layer 7
46	A1 grey, a unique sherd combining incised lines and perforations, perhaps a freak	VII	,, 5
47	A1 grey, horizontal lines incised	VII	,, 5
48	A2 grey, herring-bone incisions and traces of red dressing	VII	,, 10
49*a*	A1 grey with traces of yellow ochre dressing over incised herring-bone pattern	VII	,, 9
b	A1 similar to previous fabric	VII	,, 9

A1 Surface Roughened (Rusticated) Ware

The rusticated ware is a feature which regularly recurs at Piklihal, mainly in the Upper Neolithic. There is indeed no very clear evidence of its occurrence in the Lower. The ware was first noticed by Wheeler at Brahmagiri and well described.[2] Subsequent reports from Sanganakal and Maski have not commented upon it. The technique of manufacture of the vessels and range of forms

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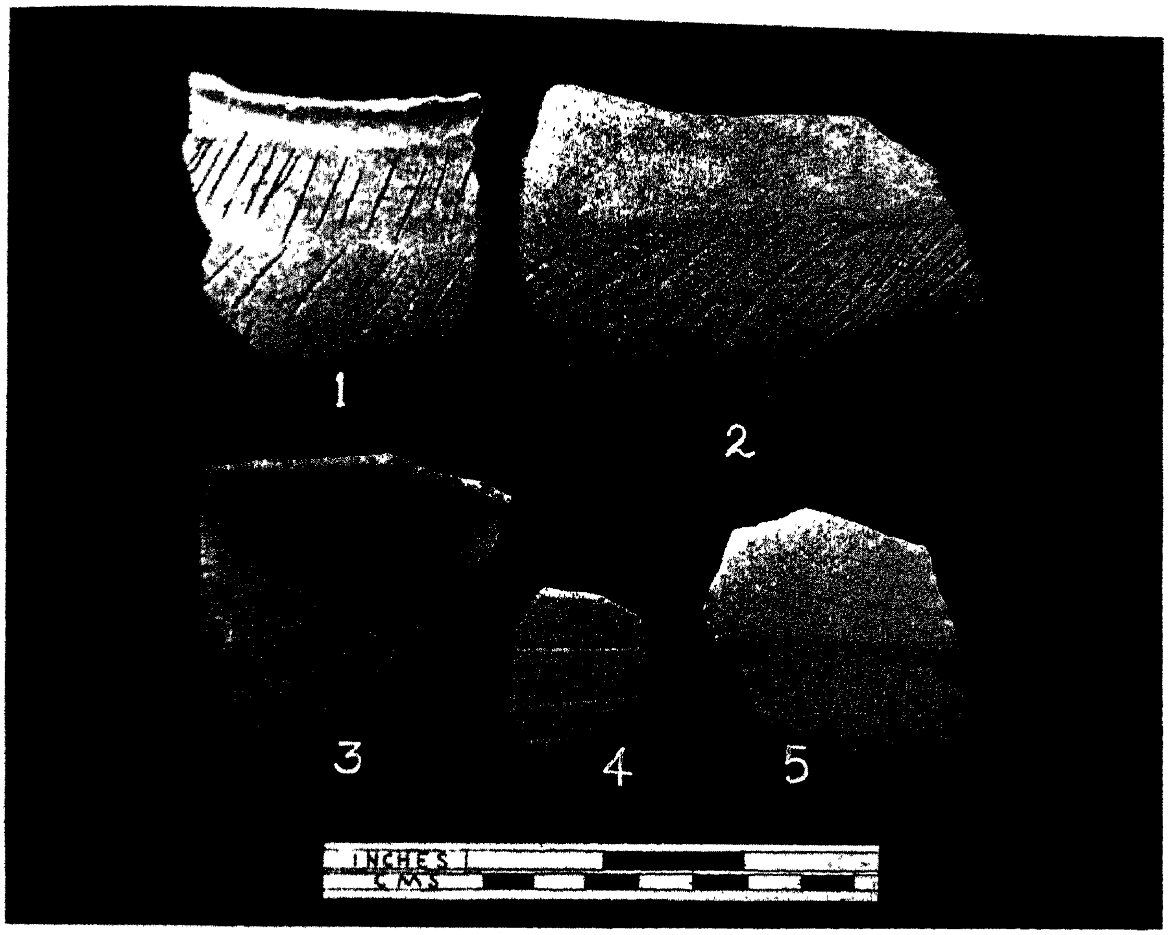
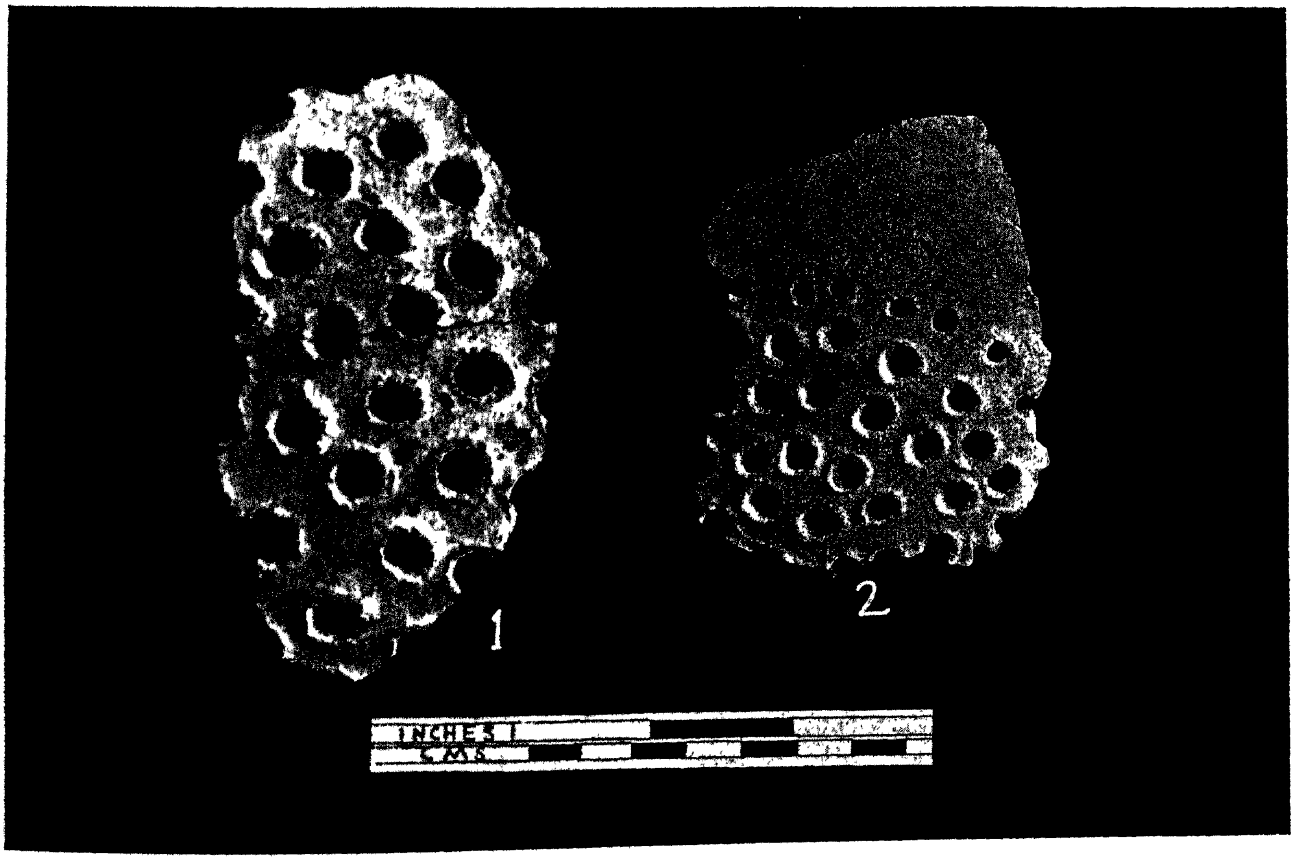
[1] Sankalia and Deo, *loc. cit.*, Fig. 85, Nos 4 and 5.

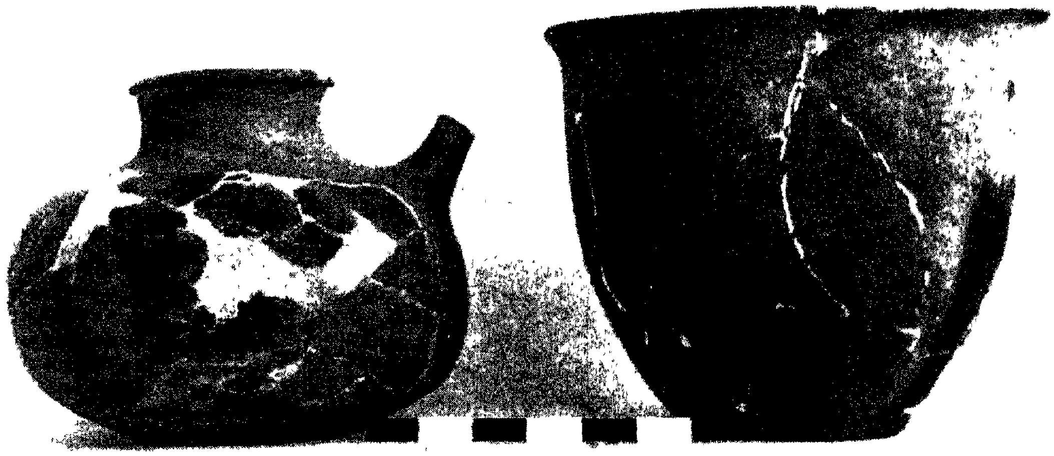
[2] *Ancient India*, No. 4, *loc. cit.*, p. 229.



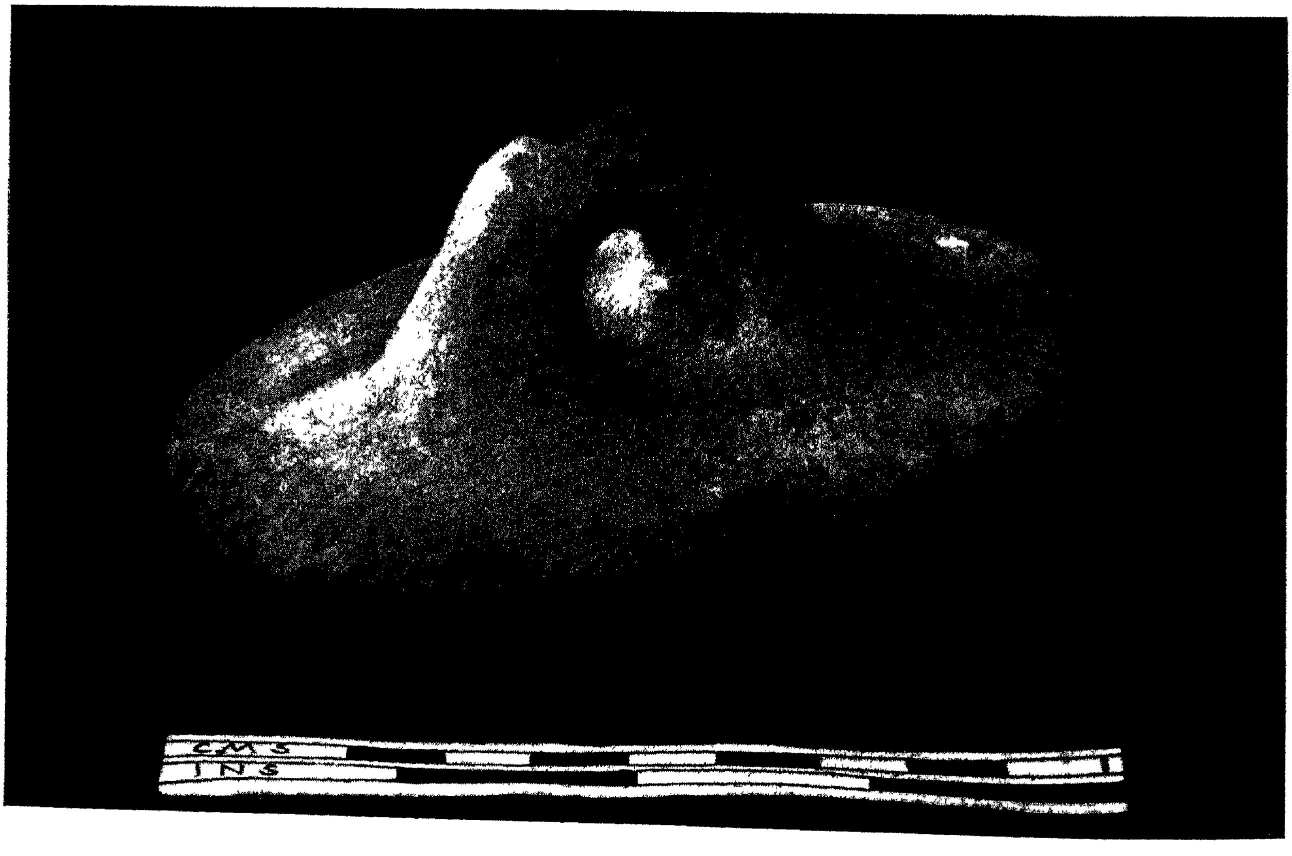
(*a*) 1, 2, 4 and 5: A1 incised ware; 3: A1 rusticated ware



(*b*) A1 perforated ware



(*a*) A5 ware vessels from burial in Site VII, layer 6, Nos. 55*a* and 52*a*



(*b*) A1 buff ware lid

largely concur with those of the A1 and 2 wares. We have already commented upon the technique of surface treatment (p. 29); whether this was regarded as solely ornamental or whether some special functional qualities were ascribed to it is impossible to surmise, but some of the vessels appear to have been cooking pots (Pl. 29*a*, 3).

Types	*Ware*	*Provenance*
Pl. 28, 1*h*	A1 coarse grey black, rusticated	VII layer 7
2*m*	A1 ,, ,, ,, ,, ...	VII ,, 4
4*k*	A1 ,, ,, ,, outer surface contains many small quartz crystals	VII ,, 9
11*h*	A1 grey buff, rusticated	VII ,, 7
11*j*	A1, rusticated	VII ,, 6
14*e*	A1, rusticated	VII ,, 5
19*j*	A1, rusticated, probably by scraping	VII ,, 5
20*m*	A1, rusticated, outer surface heavily oxidized, probably through repeated burning, or use as a cooking pot	VII ,, 6
n	A1, rusticated	VII ,, 9
o	A1 grey, very roughly made	VII ,, 5
p	A1, rusticated	VII ,, 7
q	A1, rusticated	VII ,, 8
r	A1, rusticated	VII ,, 8
s	A1, rusticated	VII ,, 7
t	A1 approaching A5, grey burnish inside and black outside, rusticated	VII ,, 8
u	A1 buff, rusticated	VII ,, 6
v	A1, rusticated	VII ,, 8
w	A1 buff grey, rusticated	VII ,, 9

(*See also* type 20*x* under incised ware above for an example of an incised sherd showing the surface roughening technique.)

A2 OCHRE PAINTED WARE

The final, and perhaps most interesting, variety of the A1 and 2 wares is also more common in the Upper Neolithic although sherds do occur in the Lower. It is probable that many more examples of this ware were found than those listed here. The pigment was applied *after firing* and although noticed during the excavations much was washed off during cleaning. Perhaps the variety suffered a similar fate at Brahmagiri where a single example only is mentioned and that without comment;[1] and at Sanganakal, where it is only mentioned in passing.[2] The ware is, however, by no means infrequent as a surface find at Neolithic sites, for example at Kallur, and once it was expected and treated with sufficient care a high percentage of A2 grey sherds were found to be thus painted during the excavations at Utnur in 1957. The ware is essentially the A2 grey, occasionally buff-grey or black-grey, and the pigment has been applied in the form of a post-firing wash, sometimes thin, but occasionally comparatively thick. The pigment used was probably an iron oxide, haematite, ground and mixed with water. This pottery has thus a true 'ochre wash', but whether it should be associated with any of the so-called 'ochre washed' wares cannot be determined without comparison. The range of forms covered is essentially that of the A2 but there are some interesting new types. Type 50 approaches the form of the Jorwe painted bowls, so does type 11, while types 19, 28 and 29 are also reminiscent of simple painted wares from Jorwe. The little spout (44*f*) is also reminiscent of examples from Nasik, Jorwe, Maheswar, etc.[1] It seems probable that all these forms may find still closer parallels when more of the pottery from Chalcolithic sites in Mahārāshtra, Malwa, Sindh, etc., is published.

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[1] *Ancient India*, No. 4, *loc. cit.*, p. 232, No. T74.

[2] Subbarao, *loc. cit.*, p. 13.

Types	*Ware*	*Provenance*	
Pl. 31, 2*n*	A2 buff grey with thin band of red ochre round rim	VII	layer 5
7*c*	A2 grey painted with single band of ochre around rim	VII	,, 6
11*k*	A2 grey with broad band of red ochre applied to outer surface and narrower band inside	VII	,, 5
l	A2 grey similar bowl with thin band of ochre around rim	VII	,, 8
19*k*	A2 grey, thin red ochre band on rim	VII	,, 7
l	A2 black/grey, broad band inside rim	VII	,, 2
20*y*	A2 grey painted with red ochre band	VII	,, 9
25*f*	A2 grey painted with thin ochre band	VII	,, 9
26*b*	A2 grey, part of body of similar form with whole remaining upper part of outer surface painted with red ochre	V	,, 3
27*g*	A unique variant of type 27 with carefully turned rim and thin ochre band. A2 grey approaching A5	VII	,, 5
28*e*	A2 grey, with painted ochre band	VII	,, 9
f	A2 grey, with similar band	VII	,, 9
29*e*	A2 grey with almost silver lustre and red ochre band on rim	VII	,, 9
f	A2 grey with thin ochre band	VII	,, 9
44*f*	A2 grey spout with band of ochre paint on end, perhaps from type 24	VII	,, 8
50*a*	A2 grey, carinated bowl with the whole upper part of the outer surface of the body painted with red ochre	VII	,, 8
b	A2 grey similar to above	VII	,, 0
51*a*	A2 (approaching A5) grey/green/black, from a large vessel with short channel-spout with red ochre band running around the edge	VI	,, 3

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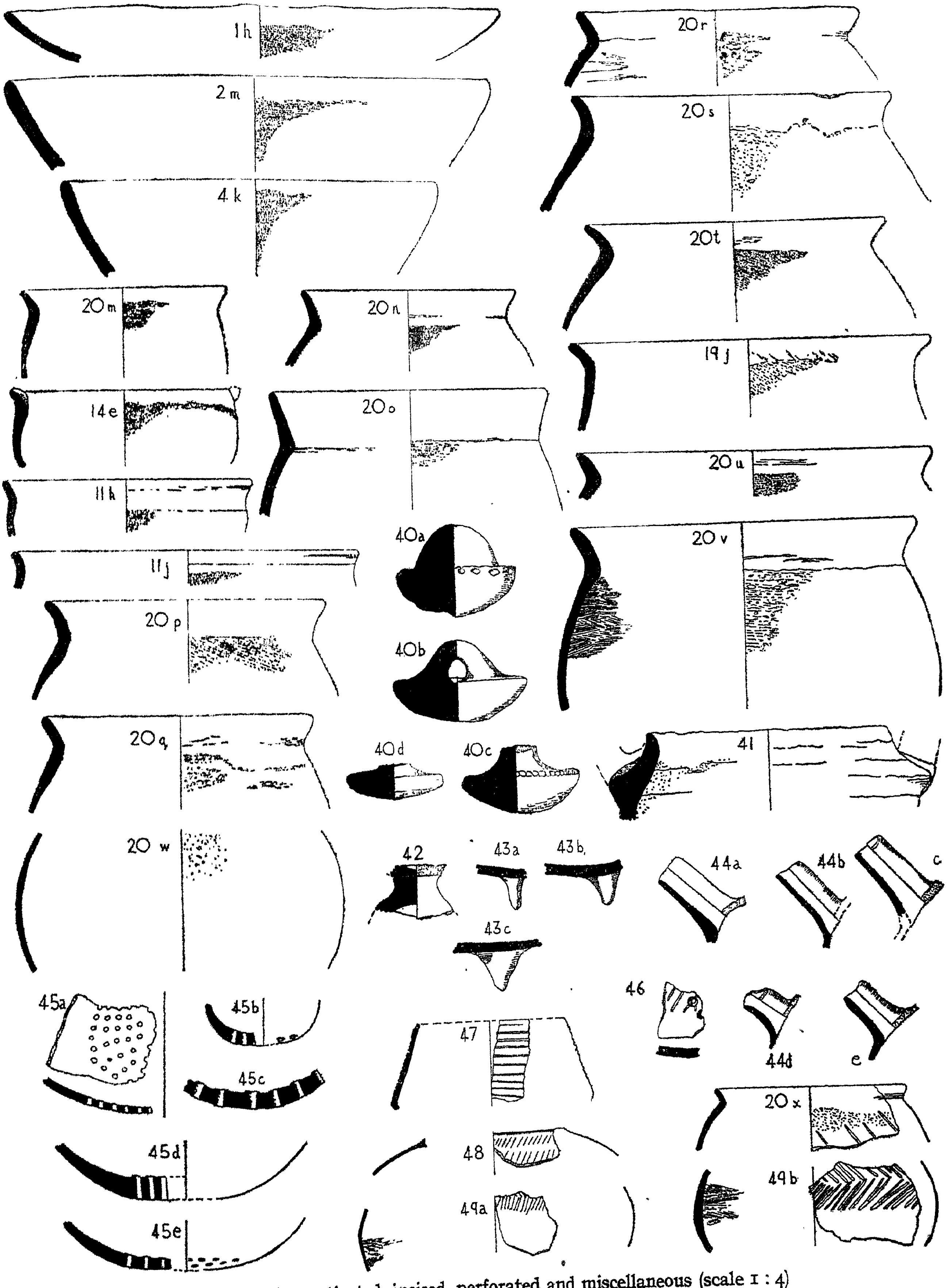
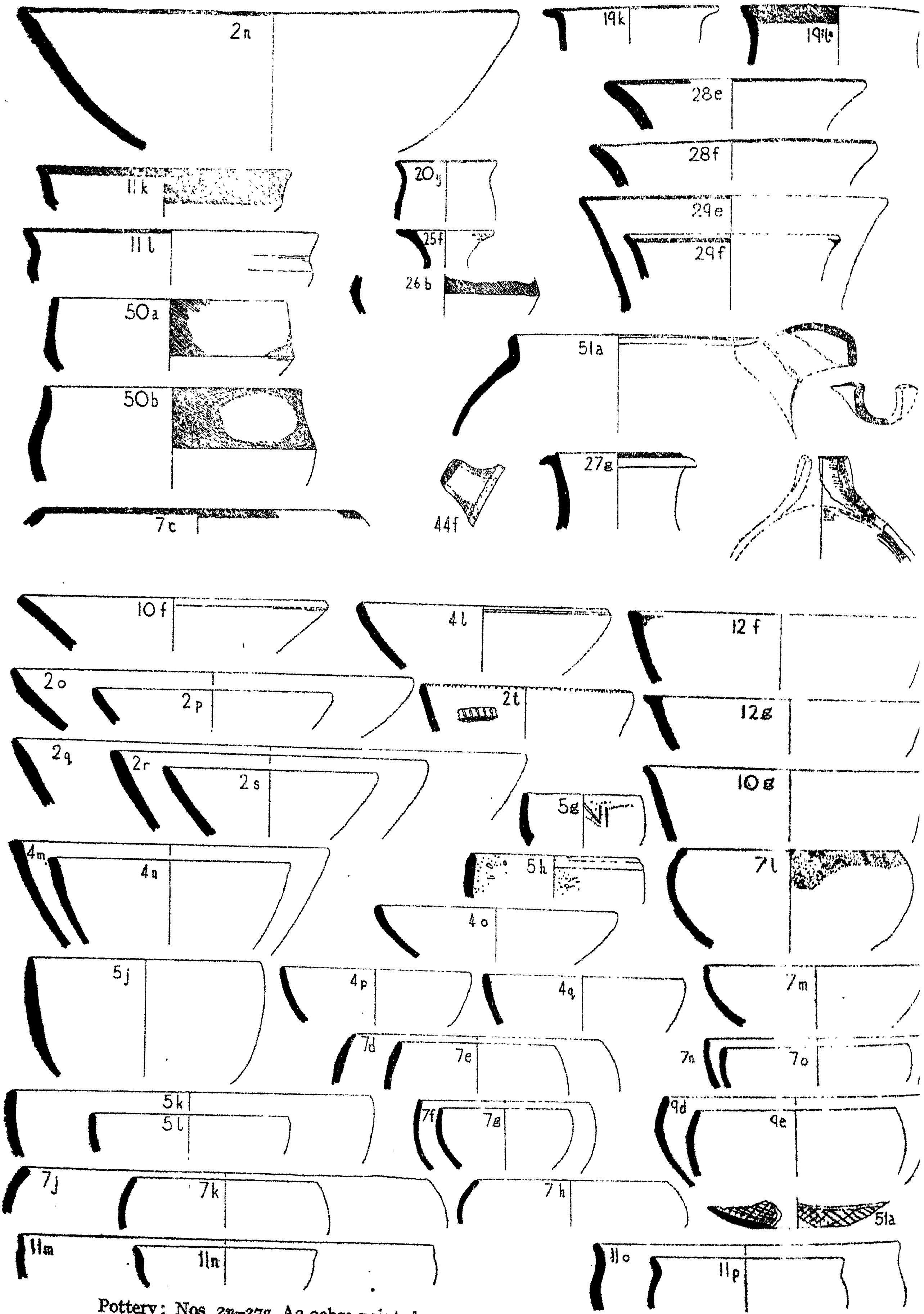
[1] Finally, the grey ware with ochre painted bands reported by Thapar at Prakash (Period I) appears to be a near relative. A similar grey ware with ochre painted rims is also reported at Bahal (Period I*a*), *Indian Archaeology, 1954-5*, p. 13, and *ibid., 1956-7*, p. 17.



Pottery: A1 rusticated, incised, perforated and miscellaneous (scale 1 : 4)



Pottery: Nos. *2n–27g*, A2 ochre painted ware; Nos. *10f–11p*, A4 and A5 wares (scale 1 : 4)

A4 AND A5 WARES

The technological division of the A1 and 2 and A4 and 5 wares has already been discussed (p. 28): now we shall consider the stratigraphical position and changes of form. Whereas the A1 and 2 wares were almost as common in the Lower as in the Upper Neolithic and fall away sharply in the Iron Age levels, the A4 and 5 wares are almost totally absent in the Lower Neolithic and are almost as common in the Iron Age as in the Upper Neolithic. Thus they appear to have been a modification of the older wares which came in during the Upper Neolithic and continued during the subsequent period. We have already noted the evidence of similarity of technique in the A5 and B1 wares. They thus afford solid support for the overlapping of the two periods noticed by Wheeler at Brahmagiri. The stratigraphical relationship of the various wares is given, for Site VII, in Pl. 58. Many of the older forms which occur in both Lower and Upper Neolithic are absent in the new wares, but many do survive, while a few new ones appear. It is particularly in the range of small bowls of types 3, 4, and 5 that the new ware is rich, and these do not occur in the Lower Neolithic. Again the lips, lugs and handles of the A1-2 ware do not occur. There are a number of slight but significant changes in individual forms: thus, 2*t* has a nail-impressed decoration around its rim; certain examples of type 7 approach very nearly forms of the red-and-black B1 ware; the square, clean cut, rim of 10*f* is new. Among other distinguishing features we may notice the series of necks, types 25–28, and the spouted vessels, type 55. The unique object labelled type 55 is probably not an example of this class at all but rather a hollow stand more closely associated with type 58 (below) and here mounted upside down.

Types	*Ware*	*Provenance*	
Pl. 31, 2 *o*	A5, black-and-buff	VII	layer 10
p	A4, buff-and-orange	I	,, 2
q	A4 mottled	VII	,, 9
r	A4 mottled	VII	,, 9
s	A4 mottled brown	VII	,, 8
t	A5 grey with finger-nail impressions around rim[1] . .	VII	,, 9
4 *l*	A4	VII	,, 6
m	A4 brown	VII	,, 7
n	A5 grey-and-black	I	,, 2
o	A5 grey-and-black, mottled	VI	,, 1
p	A5 black-and-buff, very coarse	VII	,, 2
q	A5 coarse	VII	,, 9
5 *g*	A5 approaching A1, very coarse, grey/black colour with traces of burnish on inside	VII	,, 6
h	A5 similar to preceding sherd	VII	,, 6
j	A4 grey, burnished	VII	,, 7
k	A4 brown blotchy	VII	,, 4

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[1] Sankalia and Deo, *loc. cit.*, Fig. 70, No. 68*a*.

Types	*Ware*	*Provenance*	
Pl. 31, *l*	A5 black-and-buff, burnished	VII	layer 7
7*d*	A5 black-and-grey	VII	,, 4
e	A5 very crudely made	VII	,, 4
f	A5	VII	,, 4
g	A4-5 mottled	VII	,, 4
h	A5 black-and-grey	VII	,, 8
j	A4 mottled, rim of a very large bowl	VII	,, 8
k	A5	VII	,, 4
l	A5 cream-and-black, very well made and regularly formed, inside finely burnished	VII	,, 8
m	A5 black-and-grey, mottled	VII	,, 5
n	A5 black-and-grey	VI	surface
o	A5	VI	layer 4
9*d*	A5 black, approaching B1 ware	VII	,, 1
e	A4 grey	VIII	surface
10*f*	A5 grey-and-black	VII	layer 4
g	A4 grey, burnished	VI	,, 2
11*m*	A5 grey/black	VII	,, 0
n	A4	VII	surface
o	A5 grey-and-black, mottled	VIII	unstratified
p	A5 grey and black	VII	layer 8
12*f*	A5 chocolate (compare type 58)	VII	,, 4
g	A5 buff and black (compare type 58)	VIII	surface
51*a*	A5 black inside, brown blotchy outside; with very carefully burnished diagonal pattern inside and out[1]	VII	layer 5
Pl. 32, 20*z*	A5 cream-and-black	I	,, 4
22*g*	A5 black-and-grey	VIII	unstratified
h	A4 red buff	VII	layer 4
j	A4 brown	VII	,, 6
k	A5 black-and-grey, burnished	VII	,, 4
24*c*	(incorrectly labelled in Pl. 32 should be 34*q*) A4 buff red	VII	,, 6
25*g*	A4 buff	VII	,, 9
h	A5 grey, mottled	VI	,, 4
j	A4 grey	VII	,, 4
k	A4 mottled buff	VII	,, 10
27*h*	A4	VII	,, 0
j	A4 orange buff	VI	,, 5
k	A5	VII	,, 6
l	A4 buff-grey	VII	,, 8
m	A4 buff	VII	,, 0
n	A4	VII	,, 0
o	A5 black/brown	IX	,, 2
p	A4 buff	VII	,, 6
q	A4 black/buff blotchy	VI	,, 5
28*g*	A5 black	VII	,, 6

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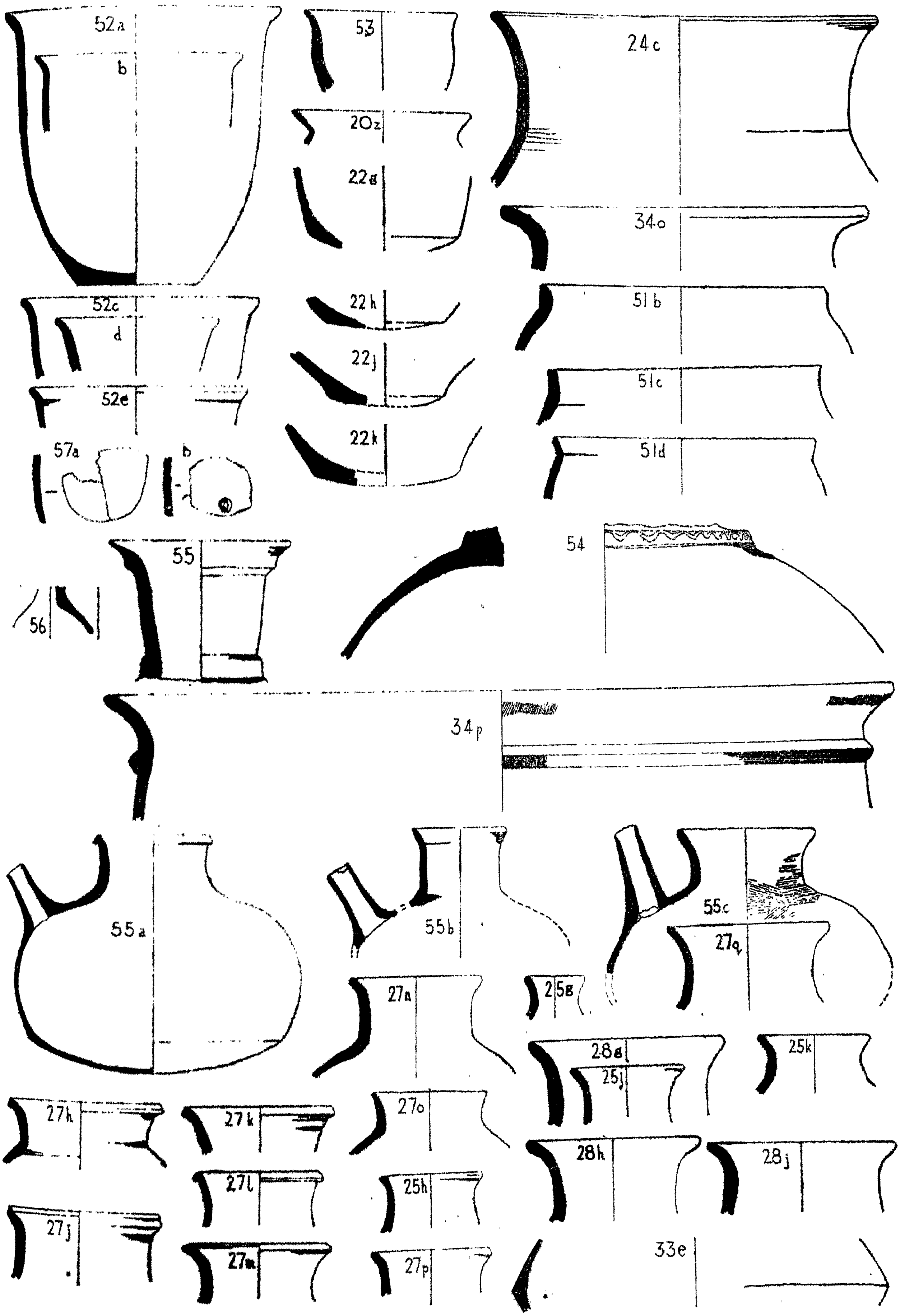
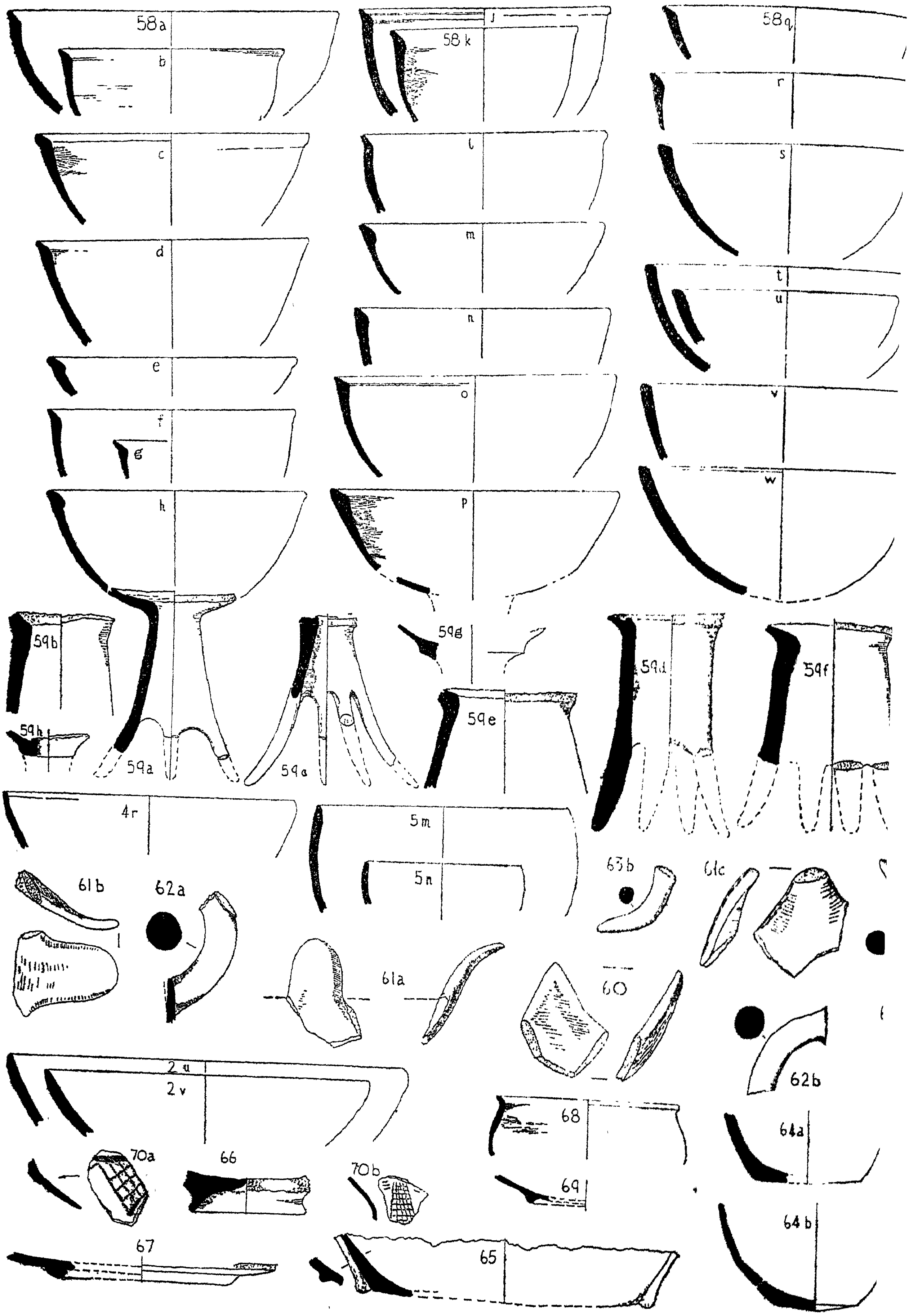
[1] This style of ornamental burnish is a commonplace at Shah Tepe (Arne, *loc. cit.*, p. 185, etc.) and Hissar III (Schmidt, E. F.: *Excavations at Tepe Hissar* (1937), p. 178ff.).



Pottery: A4 and A5 wares (scale 1 : 4)



Pottery: A3 dressed ware (scale 1 : 4)

Types	*Ware*	*Provenance*	
Pl. 32, *h*	A4	VII	layer 0
j	A5 glossy black/brown	VII	,, 8
33*e*	A4 grey	VII	,, 9
34*o*	A5 buff/black	VII	,, 9
p	A5 buff/black, decorated with *appliqué* fillet around neck	VII	,, 5
51*b*	A4 with soot and burning marks on outer surface	VI	,, 2
c	A5 grey/black	I	,, 2
d	A5 grey/black and red	I	,, 4
52*a*	A5 grey/black, burnished inside and out, compare types 19*a*, *b*, etc. From grave	VII	,, 6
b	A5	VII	,, 0
c	A4	VII	,, 0
d	A5	VII	,, 8
e	A5	VII	,, 0
53	A5 buff/black, approaching A1	VII	,, 6
54	A4 brown with *appliqué* fillet and pinched decoration, unlike anything else from the site	VII	,, 8
55	A4 brown, burnished inside and out. This unique type was mounted as shown because it seemed to be associated with type 55 (below); reflection however suggests that it is more probably to be associated with type 58 (below, Pl. 33), that is the legged offering stands, this would then become a legless variety and should be mounted the other way up	VII	,, 10
55*a*	A5 grey, spouted, burnished on outside, from grave together with 52*a* above[1]	VII	,, 6
b	A5 grey and black	VI	,, 3
c	A4 grey/black, burnished, spout with carefully applied vertical burnish strokes	VI	,, 4
56	A4 chocolate	VIIIB	,, 5
57*a*	A4 brown-and-black, this and the next example are sherds which have been carefully ground down to make circular or oval discs, one has a hole pierced through it: they were probably used as toys. The hole is scarcely large enough or near enough the centre to permit its being used as a spindle	VII	,, 4
b	A4 brown and black	VII	,, 4

A3 WARE

The technological features which distinguish the A3 ware have already been described and need no further comment. The ware is also distinguished from the other varieties of A by its occurrence: unlike the A1 and 2 which occur in roughly equal proportions in the Lower and Upper Neolithic, and the A4 and 5 which occur in mass only in the Upper Neolithic, the A3 is found mainly in the Lower Neolithic (about 75%) and in small quantity in the Upper. The very few examples from the post-Neolithic can be accounted for as strays. Another distinctive feature of the A3 ware is the presence of a small percentage of painted sherds. We have already described the ochre painted grey A2 ware and noticed that it persists throughout the period, becoming more common in the Upper Neolithic; the painted A3 ware in common with the unpainted variety appears only in the Lower Neolithic. It is not to be confused with the third variety of painted ware, the AB, which occurs in the Upper Neolithic, perhaps exclusively at the end of the period. This ware, together with the painted variety of A3, will be described in the subsequent section. But there is yet one more way in which the A3 is separated from the other A wares: the range of forms is quite unlike those of the other varieties. A glance at Pl. 33 suffices to establish this fact, apart from rare examples of types 2, 4 and 5 almost all the other types are new and the vast majority of them belong to, or are apparently connected with, types 58 and 59, the legged stand. In this circumstance we shall describe the types individually as they occur in the catalogue below. The ware together with its painted variety occurs at Brahmagiri in the IA period,[1] also apparently at Sanganakal and at Maski in the pits ascribed to the 'earliest levels of Period I'.[2] We shall discuss the external affinities of the painted variety below.

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[1] These spouted vessels may be compared with a long series starting locally at Brahmagiri (*Ancient India*, No. 4, *loc. cit.*, Fig. 21, T46), *via* Nasik and Jorwe (Sankalia and Deo, *loc. cit.*, Fig. 1, d; Fig. 61, 1 and 2), Maheshwar, etc., to the startlingly similar vessels of Shah Tepe (Arne, T. J.: *Shah Tepe* (Stockholm, 1945), Fig. 235, etc.).

Type 2 is represented by two typical examples, both from the Lower Neolithic.

Types	*Ware*	*Provenance*		
Pl. 33, *2u*	A3 ware, grey body with black dressing, burnished ..	VIIIA	layer	5
v	A3 buff body with red burnished dressing ..	VII	,,	10

Type 4. A single rim of this type comes from a low level of the Upper Neolithic.

Types	*Ware*	*Provenance*		
Pl. 33, *4r*	A3 black dressing	VII	layer	8

Type 5 is represented by two typical sides of bowls coming from the Lower Neolithic.

Types	*Ware*	*Provenance*		
Pl. 33, *5m*	A3 black dressing, burnished	VII	layer	9
n	A3 red dressing, burnished	VII	,,	9

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[1] *Ancient India*, No. 4, *loc. cit.*, p. 222.

[2] *Ibid.*, No. 13, *loc. cit.*, p. 38

Types 58-9 introduce one of the most curious and perplexing groups of pottery from the site, numerically dominating the A3 ware. The form is that of a truncated conical cylinder on the top of which is luted a bowl and to the base of which are attached four or five legs (*see* Pl. 33 and Pl. 34). The reconstruction in Pl. 34*a* and *b* was made in the Institute of Archaeology, London, from two fragments brought home in 1952. The two fragments do not come from a single original and among the collections in Hyderabad there are several larger and more nearly fitting examples, from the same layers. However, when I had finished drawing the range shown in Pl. 33 the exact form seemed to be established beyond doubt and in its light the reconstruction was made. A curious feature is that the type more nearly conforms to a norm than does any other so far listed. Throughout the range the ware is A3 red, with one or two chocolate or brown ochre variants. The type is almost unique, it does not occur at any other site, and is not reported at either Sanganakal, Brahmagiri or the recent excavations at Maski. Only two specimens of a closely related form are known: one from the earlier excavations and the other from surface collection at Maski: I shall illustrate one in a later volume. A characteristic is the circular aperture pierced in the base of the bowl where it is luted on to the stand (Pl. 34*b*). We have already commented upon the peculiarity of the range of forms of the A3 ware; type 58 is illustrative of this peculiarity. It is not easy to see any normal domestic function for which the stand, delicate as its legs are and top heavy as it inevitably tends to be, is suited. On the other hand it has been made with great care. The probability is therefore that it was manufactured for some special or ritual use. We shall see below that the terracotta figurines of bulls from the Lower Neolithic are made of the same ware, and that they too had probably some ritual function. The form does not occur in other varieties of A ware, but there is a possible exception in the (?) stand of A4 brown (Pl. 32, type 55) which could be a legless variant and could have well fitted the very similar bowl forms 12*f* and *g* (Pl. 31).

The conclusion is that we have here a very rare variant of the offering stand, known from the Indus valley sites and from Chalcolithic sites of Iran, Turkestan, and western India. We shall consider the possible significance of the comparison below.

Types	*Ware*	*Provenance*		
Pl. 33, 58*a*	A3 red dressing, burnished	VIIIA	layer	4
b	A3 ,, ,, ,, with black reduced line around rim	VII	,,	11
c	A3 red dressing, burnished	VII	,,	10
d	A3 ,, ,, ,, very similar to *b* ..	VII	,,	11
e	A3 ,, ,, ,, ...	VIIIA	,,	5
f	A3 ,, ,, ,, ...	VIIIA	,,	4
g	A3 black ,, ,, ...	VII	,,	5

Types	*Ware*	*Provenance*	
Pl. 33, *h*	A3 red dressing, burnished	VII	layer 11
j	A3 ,, ,, ,,	VII	,, 11
k	A3 ,, ,, ,,	VII	,, 11
l	A3 chocolate brown	VII	,, 7
m	A3 red dressing	VII	,, 9
n	A3 ,, ,,	VII	,, 10
o	A3 ,, ,, (upper part of Pl. 34*a* and *b*)	VII	,, 11
p	A3 ,, ,,	VII	,, 9
q	A3 raw sienna dressing, heavily worn	VII	,, 9
r	A3 red dressing	VII	,, 11
s	A3 ,, ,,	VII	,, 10
t	A3 ,, ,,	VII	,, 8
u	A3 ,, ,,	VIIIA	,, 5
v	A3 brown ochre dressing	VII	,, 10
w	A3 red-orange dressing	VII	,, 10

Type 59 are parts of the lower portions of the stands. In all cases where the foot remains the legs, or the scars where legs have been broken off, can be seen. Similarly in the often fragmentary upper portions the scars and junctions of the bowl and the cylinder can be clearly seen. Only one example (59*g*) has anything approaching a clear cut moulding on it. This, however, is also present upon the base (type 55) already referred to.

Types	*Ware*	*Provenance*	
Pl. 33, 59*a*	A3 red dressing, four legs (lower part of Pl. 34*a* and *b*)	VIIIA	layer 4
b	A3 red dressing	VIIIA	,, 4
c	A3 ,, ,, four legs	VII	,, 10
d	A3 ,, ,, one remaining leg and three scars	VIIIA	,, 5
e	A3 ,, ,, upper part only	VII	,, 9
f	A3 ,, ,, scars of five legs	VII	,, 10
g	A3 ,, ,, upper part only	VII	,, 9
h	A3 ,, ,, from junction of bowl and stand, the scar on the lower side visible	VII	,, 11

Types 60-1 are lugs not much different from those noticed in the A2 ware above. They, too, belong essentially to the Lower Neolithic and appear to be derived from bowls either of type 58 or perhaps type 2 or 4. In all cases the lugs stand up at an angle approaching 45°. Similar lugs are found at Maski[1] where they also come from a pit of the earliest level of Period I.

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[1] *Ancient India*, No. 13, *loc. cit.*, Fig. 10, 2*e*.

Types	*Ware*	*Provenance*	
Pl. 33, 60	A3 red lug from bowl of type similar to 58. The lug is of triangular form	VIIIA	layer 4
61*a*	A3 red lug from similar bowl	VII	,, 9
b	A3 light burnt sienna dressing, burnished inside, from a similar bowl (illustration is mounted inverted) ..	VII	,, 11
c	A3 red lug from similar bowl	VII	,, 11

Type 62 includes circular sectioned handles (?) from unknown vessels. At first I was inclined to think that they might be parts of terracotta bulls similar to the A3 ware specimens discussed below, but in the end it seems more probable that they are either handles or else parts of some looped stand. 62*a* has still a part of the wall of a vessel, probably of type 58, at one end and a scar at the other. The form is peculiar to the A3 ware and to the Lower Neolithic. No comparable forms are reported at other Deccan sites.

Types	*Ware*	*Provenance*	
Pl. 33, 62*a*	A3 red handle, wall of pot of similar ware at one end	VII	layer 10
b	A3 red handle, similar to above	VII	,, 11

Type 63 includes legs of stands and horns of terracotta bulls of the A3 red ware. (*See also* Pl. 41*a*.)

Types	*Ware*	*Provenance*	
Pl. 33, 63*a*	A3 red leg of terracotta from stand of type 59 ..	VII	layer 11
b	A3 red shorter curved horn of terracotta bull	I	,, 12

Type 64 includes two bases of small vessels of unknown form. 64*a* is in a ware which may well be a late survival of A3, with very thin red dressing and non-micaceous clay.

Types	*Ware*	*Provenance*	
Pl. 33, 64*a*	?A3 red, base of small vessel of (?) type 20 ..	VII	layer 4
b	A3 red base	VII	,, 9

Type 65 is a unique piece of probably very late (i.e. Upper Neolithic) imitation of A3 ware, a surface find. It is part of the base of a broad shallow bowl

of uncertain form with a little vertical ridge ending in what appears to be a small foot. The surface is dressed with an unburnished red dressing.[1]

Types	*Ware*	*Provenance*	
Pl. 33, 65	?A3 red, black body	VI	surface

Type 66 is the first of three ring-footed bases. They have already been mentioned in connection with shaping processes (above, p. 28). The ring-foot appears to have been luted on to the body of the vessel when leather hard.

Types	*Ware*	*Provenance*	
Pl. 33, 66	A3 black burnished dressing, black body. Probably the base to type *2u* (above), could possibly belong to the same vessel	VIIIA	layer 5

Type 67 is a broader, flatter base with a similarly applied ring, of a similar ware. It is not easy to guess what form the vessel can have had, unless it was type 1.

Types	*Ware*	*Provenance*	
Pl. 33, 67	A3 black, traces of burnish, black body	VII	layer 9

Types 68 and 69 are almost certainly two parts of similarly formed vessels with a tiny ring-foot similar to type 67.

Types	*Ware*	*Provenance*	
Pl. 33, 68	Rim and wall of small vessel of A3 with red dressing and traces of burnish, soft micaceous clay ..	VII	layer 11
69	A3 black dressing with traces of burnish ..	VII	„ 8

Types 70a and b are sherds of A3 painted ware and will be described below.

A3 PAINTED WARE

The A3 painted ware is a rare but regular concomitant of the Lower Neolithic levels throughout the site. As at Brahmagiri and Maski the fragments were very

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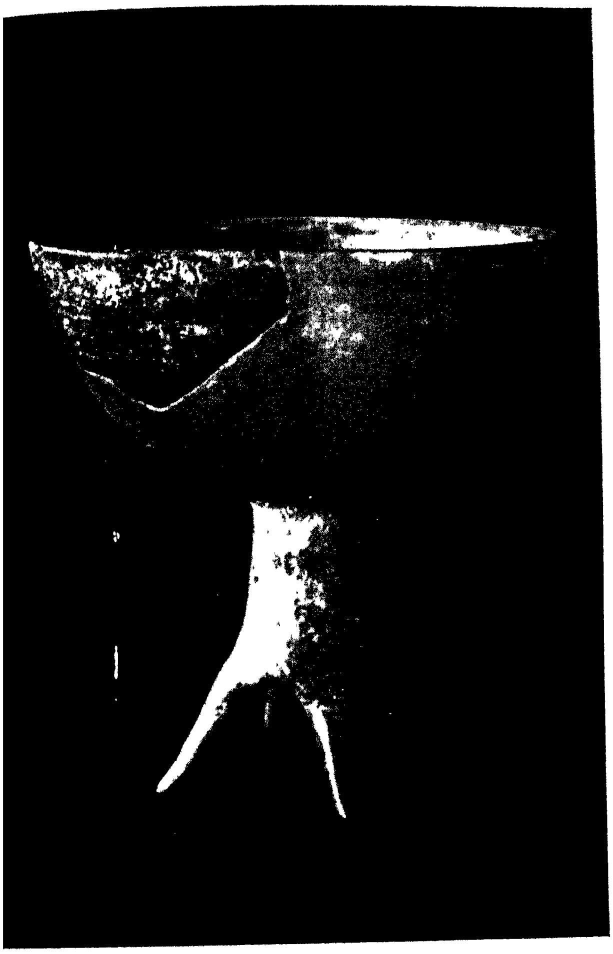
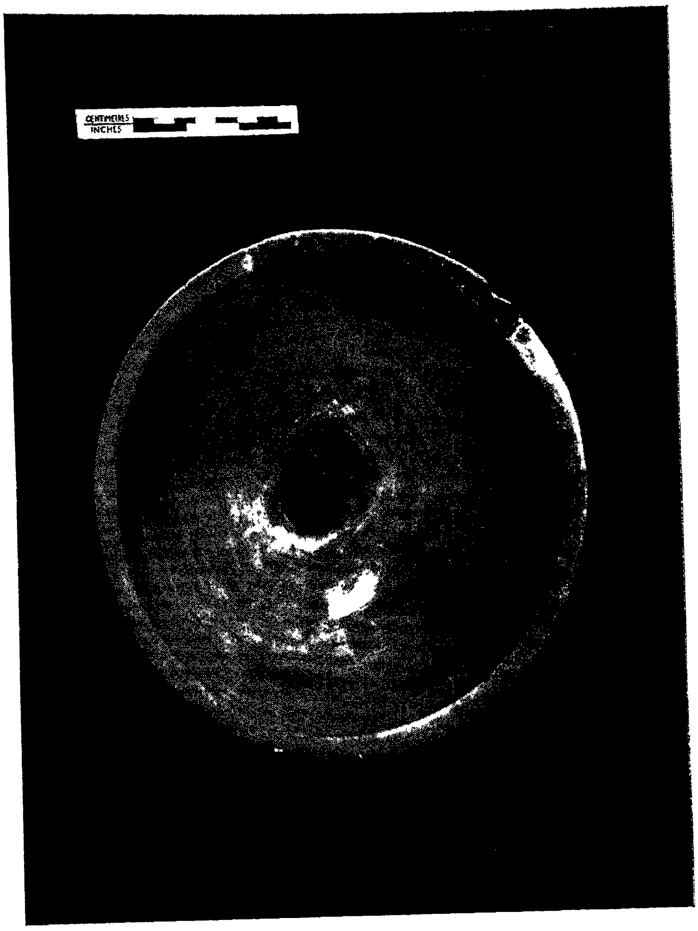
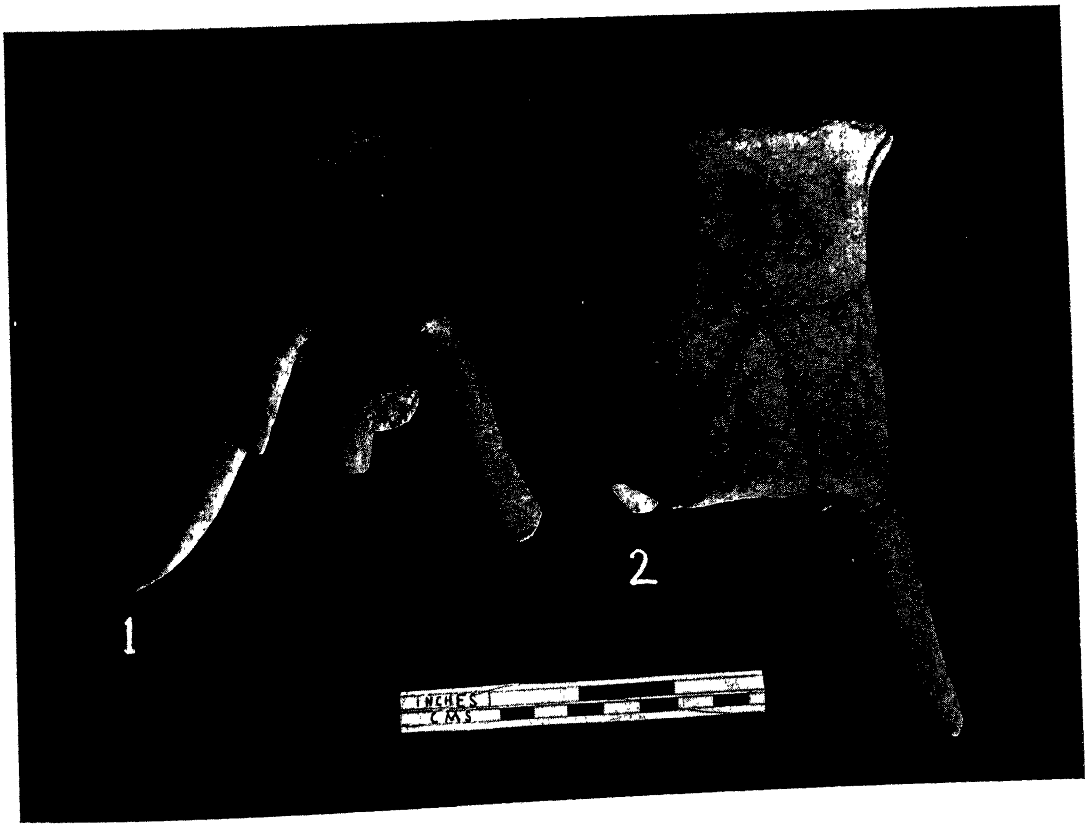
[1] What may be a similar ridge is found upon fragments of a bowl from Shah Tepe (Arne, *loc. cit.*, p. 217 and Pl. LVIII, Fig. 461*a*).



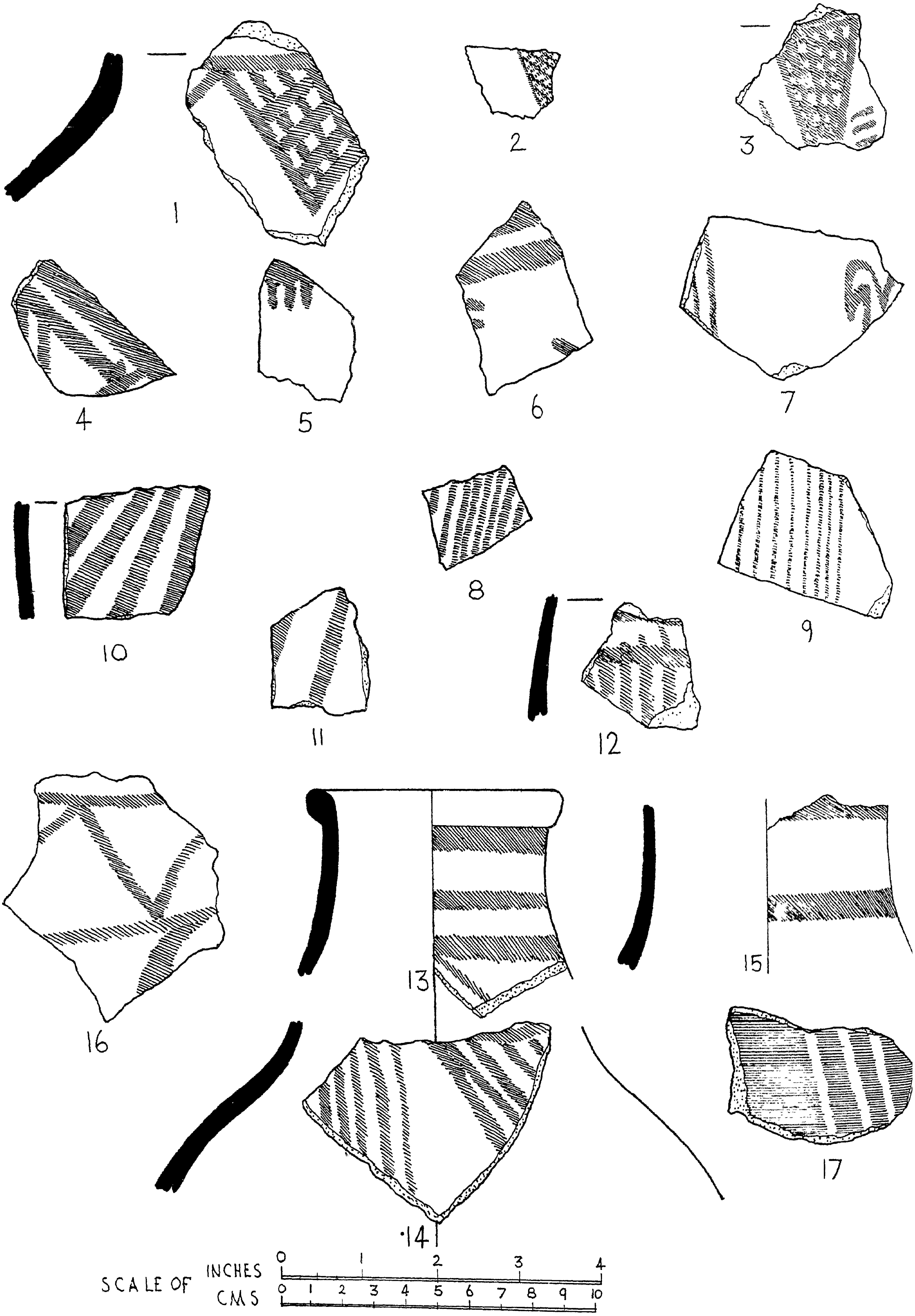
econstruction of A3 red ware legged stand, No. 59*a*



(*b*) Reconstruction of A3 red ware legged stand, No. 59*a*



(*c*) Lower portions of legged stands, Nos. 59*c* and 59*d* in A3 red ware



Nos. 1–8, A3 painted sherds; Nos. 9–15, AB ware painted sherds; Nos. 16, 17, other painted sherds

small and it is not possible to reconstruct much of the vessels to which they belonged. The paint used appears to have been a manganese oxide. This gives a pale mauve, deeper purple or even blackish brown line when it is applied over the red, or brown ochre colours of the burnished A3 dressing. The clay is highly micaceous and every other aspect of the ware links it to the A3. Of the sherds studied only two belong to any sort of recognizable forms, these (Nos. 1 and 3 of Pl. 35) are both the shoulders of necked vessels, probably generally resembling the form of 13 and 14 of the same plate. It is interesting to notice that nearly all the painted sherds of A3 are painted over a brown ochre to raw sienna coloured dressing. Thus there is a sharp differentiation in both form and colour convention between the painted sherds and the A3 plain wares. Another problem arises which, at the moment, does not allow of a definite solution. In the excavations at Brahmagiri Wheeler assigns to the IA period two kinds of painted pottery, a red burnished slipped ware over which the purple paint was applied and an unburnished buff slipped ware.[1] At Piklihal we have in the Lower Neolithic levels only one kind of painted pottery, if the odd example of A2 grey ochre washed ware be excepted, a brown ochre (? = buff) burnished ware, with very occasional red burnished sherds. The only unburnished painted ware (AB) we find comes from levels which are much later and from surface collections; and as we shall show below these appear to be associated with the end of the Neolithic period rather than the beginning. In the recent Maski excavations it also appears as if only the one, burnished, kind of painted ware occurred, mainly in the earliest level of Period I.[2] The evidence from Sanganakal is not helpful on this point, but from conversation with Dr. Subbarao it seems clear that there too the unburnished painted sherds came mainly from surface collections rather than the excavations. However, at Piklihal the slight stratigraphic evidence is supported as we shall see by technological and suggests that the burnished A3 painted ware is to be carefully differentiated from the unburnished AB painted. The only clear decorative motif visible on the A3 painted sherds is apparently a series of radiating triangles, running like the points of a star from a band drawn around the neck of the vessel. Nos. 5 and 7 also exhibit wavy lines. The nearest comparisons to be found are at Jorwe where wavy lines and delicate cross-hatchings do appear although the main, radiating motif is not to be found. Further afield, in Iran such radiating patterns are quite common.

Types	*Ware*	*Provenance*	
Pl. 35, 1	A3 burnished and burnt sienna dressed sherd with black/purple cross-hatched triangle painted before firing. From the shoulder of a necked jar . .	I	layer 8
2	Sherd of similar ware with indeterminate cross-hatched design, perhaps from lozenge-shaped pattern	I	,, 8

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[1] *Ancient India*, No. 4, *loc. cit.*, p. 222.

[2] *Ibid.*, No. 13, *loc. cit.*, p. 36.

Types	*Ware*	*Provenance*	
Pl. 35, 3	Sherd of similar ware to 1, coming from the shoulder of a similar, although larger, jar, in addition to the radial triangle there is part of a group of short strokes	I	layer 8
4	Sherd of similar ware and pigment	I	,, 12
5	Sherd of similar ware and pigment decorated by wavy line	I	,, 12
6	Sherd of similar ware and pigment	I	,, 7
7	Sherd of similar ware and pigment	VII	,, 10
8	Sherd of similar ware and pigment	VII	unstratified

OTHER PAINTED SHERDS

We now list two unique sherds, neither from Lower Neolithic levels and neither belonging to any very clear ware group.

Types	*Ware*	*Provenance*	
Pl. 35, 16	Sherd of drab black clay with white lime wash and painted manganese design over. The painted surface has been applied after firing. Unclassified in terms of ware, unique	VIIIC	surface
17	Sherd of gritty black bodied clay with green brown fused surface belonging to the typical A4 ware. The surface has three orange lines running across it under the final dressing. This could be a forerunner of the B2 painted ware; or it could be a chance product: unique	VII	layer 8

AB WARE

We now consider the problematic group of plain and painted sherds referred to above. There are less than a dozen to be discussed and thus the evidence they give is of a slender nature and too much reliance cannot be put upon it. The history of the problem is as follows. In my field work in 1952 I found as surface finds at several sites, including Brahmagiri and Piklihal, sherds of a painted ware, quite distinct from the A3 painted. It appeared to answer to Wheeler's second, *unburnished*, ware in Brahmagiri IA; but with one peculiarity which he had not stated, that our sherds appeared to be *wheel-thrown*. Not only in this way but in several others were they separated from the true A wares as a whole. When I was writing my thesis in London in 1953-4 I considered this problem again and was struck by a new piece of evidence. The pottery from the Brahmagiri grave groups A and B contained one painted vessel which could supply the answer, it had every appearance of being wheel-thrown in its upper parts, even if the lower were beaten, and answered well to the form associated with the sherds.[1] In the meanwhile the excavation at Piklihal had revealed numerous A3 painted sherds in the Lower Neolithic but apparently no other painted sherds which could be compared with my surface finds. However, when I returned to Hyderabad in 1957-8, fortified by my own observation of the painted pot from the Brahmagiri grave group and by Dr. Subbarao's comment that the slab-lined pits, which at Brahmagiri were earlier than the ordinary stone cist 'Megalithic' graves, were closely parallel to some of the Chalcolithic graves from Bahal, I found whilst making a close re-examination of the Piklihal pottery that there were in fact several sherds of painted ware and plain which could be grouped in this new class. As I had already allocated the names A and B to two great pottery groups I coined the new term AB to express the intermediate position which this ware appeared to occupy. I shall now describe it as it appears at Piklihal.

The sherds we are to describe have all a fine gritty body clay, without any trace of mica. Sherds from the vicinity of the neck show greater regularity of body thickness and of horizontal finger-impressed lines, which taken together are consistent with their being wheel-thrown and mark a second contrast to the A wares. The majority of the sherds have been treated with a thick slip, over which some have had a thin red dressing applied. The painting is on this dressing. When fired the body has turned to a grey-black, the slip to a buff, the dressing bright red and the paint to a typical manganese purple-brown. Some of the sherds show evidence of a slight surface crazing or crackle; this is a result of firing shrinkage and appears to be associated with the application of the red dressing, perhaps because its constituent parts had a fluxing effect. The level of firing is higher than that found in any group of A ware sherds, although it is approached by the A4 and 5 wares. None of the sherds show burnish. The only forms we have noticed are those listed as 38*a, b, c,* and *d* in Pl. 39. These are all narrow-necked vessels decorated with a slip and red dressing, and in two cases painted. The painted decoration takes the form of simple bands around the neck, in one case with straight lines running diagonally from the bands. Type 38 may be compared, not only with Nos. 10 and 12 of the Brahmagiri group mentioned above but also with painted necks from Jorwe.[2] Here there are several comparable neck forms with simple bands of colour, some even with radiating lines; many are described as wheel-thrown. Again the painted necked pot from Nasik is not far removed.[3] Finally we may cite the pottery from Bahal IB.[4] The stratigraphical evidence afforded by the Piklihal examples is, as already noticed, very slender. Of the painted sherds three are from surface, two from Site VII, layer 5, and one from Site VII, layer 0; a further sherd from Site VII is unstratified. The plain sherds of type 38 come from VII, layer 0 and VII, layer 5. This evidence is the basis upon which an intrusion is postulated between layers 5 and 6 of Site VII.

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[1] *Ancient India*, No. 4, *loc. cit.*, pp. 221-2.

[2] Sankalia and Deo, *loc. cit.*, Fig. 61.

[3] *Ibid.*, Fig. 1.

[4] *Indian Archaeology, 1956-7*, pp. 17–19.

Painted sherds:

Types	*Ware*	*Provenance*	
Pl. 35, 9	AB ware, hard-fired reddish clay, probably wheel-thrown, surface is without dressing but has a series of fine purple lines painted on it: no burnish	VII	layer 5
10	AB ware sherd with dark grey, well-fired body, almost certainly wheel-thrown, the surface has been painted with a red pigment over which purple lines have been added. No trace of burnish, but crazing has resulted from firing	Area B	surface
11	AB ware, well-fired grey body and buff slip, unburnished. Painted decoration is typical manganese purple. Almost certainly wheel-thrown	,,	,,
12	AB ware, hard-fired grey body with buff slip and pinkish surface dressing. Traces of purple pigment in two strokes. No burnish, possibly wheel-thrown	,,	,,
13	AB ware, neck of jar of type 38 in hard-fired dark grey clay with bright red surface and three horizontal bands of purple pigment. A single line is drawn diagonally from the neck. The surface is without burnish. Wheel-thrown. (*See also* 38*a* of Pl. 39)	VII	layer 6
14	AB ware, sherd of well-fired reddish clay from the shoulder of a vessel of type 38, surface and painting very similar to those of 13. Probably wheel-thrown	VII	unstratified
15	AB ware, neck of type 38 of fine grey clay with brownish red surface dressing and two broad bands of purple pigment. Almost certainly wheel-thrown. (*See also* 38*b* of Pl. 39)	VII	layer 5
Pl. 39, 38*c*	AB ware, light red surface on grey body, wheel-thrown, neck of vessel	VII	,, 6
38*d*	AB ware, similar ware and form to above	VII	,, 5

(*See also* type 30 above, p. 41)

A WARE: COMPARATIVE

In the foregoing catalogue we have noticed many individual comparisons of types, particularly from a limited range of sites. We shall now try to summarize this evidence and consider it in its more general light. The Neolithic wares reveal slight variations in forms and fabric between the Lower and Upper Neolithic at Piklihal itself. Particularly, the A3 ware disappears in the Upper Neolithic and with it the legged stand and the distinctive lugs, handles, hollowed feet, etc. There appears to be evidence for the A3 ware, and probably for other distinctly Lower Neolithic forms at Brahmagiri and at Sanganakal; at Maski such evidence is limited to a few pits in the very lowest levels of the site. Similarly there are some types which appear only in the Upper Neolithic. It is not hard to find parallels at Brahmagiri and at Maski in the IB period and 'Chalcolithic' Period I respectively. We have also seen that a substantial range of types is found at Jorwe. It is not easy to determine how exactly these relate to the Piklihal sequence, and until more evidence, from the Chalcolithic sites of Maharashtra and beyond, is published this interesting problem must remain incompletely explored. It certainly appears that there may be evidence in Maharashtra of at least two strata of contact, the earlier corresponding with the Upper Neolithic of Piklihal, and the later corresponding with the late Neolithic intrusion there and at Brahmagiri.

In the regions beyond we are faced by a curious problem: the Deccan Neolithic pottery shows clear general technological affinities to some assemblages of hand-made pottery of Saurashtra and Sindh but it is clearly cut off from the wheel-thrown pottery of the Indus valley and much of the painted pottery of Baluchistan and its western extensions. It is differentiated from this by being almost entirely hand-made, or at least made upon the turn-table. If we seek comparisons for the potter's tradition as a whole we find that there is surprising evidence at a certain period from north-eastern Iran and Turkestan. Masson has recently drawn attention to the way in which the evidence from Namazga Tepe confirms that of Anau.[1] The period of Anau III is however represented by three culture periods at the other site. Namazga III represents the final phase of painted pottery, followed by IV and V periods in which plain and painted pottery exist side by side. Finally a plain pottery only occurs (VI). Now these three periods correspond in pottery types to Shah Tepe IIA, B and III and may be dated following Schaeffer[2] to between 2000 and 2600 B.C. The potter's tradition at Shah Tepe strikingly corresponds to that of Piklihal. To make a detailed comparison is not our intention, but we may indicate some of the comparable techniques. The painted pottery is in a minority, the plain a majority.[3] The entire range is hand-made, with evidence for the use of the 'disc' or turn-table, usually around the mouth of the pot. The painted ware is generally treated with a layer of slip, engobe, of red to buff colour, over which the black to purple paint has been added. The unpainted pottery is generally black to grey in colour; buff also occurs. Throughout both painted and unpainted, burnish is a characteristic feature. The burnish is sometimes applied in regular horizontal or perpendicular strokes and sometimes in such a way as to form a pattern, rectangular or diagonal. Every one of these features has been recorded at Piklihal. The range of forms includes such special features as handles, lugs, spouts, channel spouts, perforated bowls (which also occur in other sites of Dagestan), lipped bowls (both of these recur at several of the sites recently excavated by the Soviet archaeologists), external applied ribs, mat impressed bases (this feature does not occur at Piklihal but does occur on an unpublished base from Bellary). Thus all these features are found both in the Deccan Neolithic and at Shah Tepe. Even if the many different forms are noticed there remain significant similarities. These include the spouted pots, offering stands, hollow-footed cups, terracotta horns, disc lids with central knob, etc. What these similarities mean it is impossible to know, but it is reasonable to expect that they have some meaning in terms of culture contact. We do not propose to discuss the relationship of Shah Tepe to Sialk, Hissar, etc., although this has an obvious bearing upon the dating of the pottery. There are other technological affinities which may ultimately prove significant, although they cannot yet be evaluated. For example: the relationship of the incised 'Jhangar' grey wares to those of the Deccan Neolithic, or of the 'Quetta wet' ware of Fairservis or De Cardi's Anjira granulated ware to our rusticated ware. Whatever these may indicate it seems clear, at least, that the most convincing affinities are with the grey wares of Shah Tepe IIB, etc., until further evidence can be produced.

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[1] V. M. Masson: *U.T.A.K.E.*, VII, p. 233f.

[2] C. F. A. Schaeffer: *Stratigraphie comparée*, p. 596.

[3] For this and the following description the reader is referred to the relevant parts of T. J. Arne's *Excavations at Shah Tepe* (1945).

B. THE B WARE COMPLEX

INTRODUCTORY

The interested collector could, if he cared, spend several weeks in visiting sites in Raichur likely to produce ancient remains and collect quantities of potsherds from their surfaces. Such a collection would probably show, if he took the trouble to make a technological analysis, pottery belonging to three main traditions. We have already described one, the A ware or Neolithic, which in terms of quantity of surface finds would probably be least well represented. A second group of pottery would be that which, starting from the present day and working backwards, he could associate with the modern tradition, whenever it may have started. This group we shall call the D ware: it will be considered below. Lying in point of time, no less than of technological evolution, between these two great groups would be a great mass of red, black, and red-and-black pottery to which we give the collective label B ware. The letter C we reserve for imported wares of the early historic period, made outside the district and brought in probably as objects of trade. This division into four groups, of which only three, the A, B and D, are truly indigenous, is in fact the system of classification which I adopted in 1952–4 in my thesis while studying the surface collections made at sites in the Raichur Doāb. I hope to show in a later volume, how far such purposeful collection was able to produce typological completeness and evidence of relative age. Our purpose in introducing the matter here is to account for the treatment in one complex of the pottery of the Iron Age ('Megalithic' period), the early historic period, and the early medieval. We are prompted to follow the system for two reasons: first that technologically the pottery of these three periods belongs to a single complex, different from both the A and the D, and second that the excavations at Piklihal were chiefly aimed at the Neolithic period and as it happened revealed very little actual habitation, etc., of any later period. Thus the evidence which we have to produce is only of a general nature and shows stratigraphically very little of the chronological subdivision of these fifteen hundred years which we may be sure further work at selected sites will produce. Thus our treatment of the B wares and their subdivision will follow technological rather than stratigraphic divisions, emphasizing thereby the evolving aspect of the potter's craft.

TECHNOLOGY

We shall consider the technology of the several varieties of B ware side by side, the better to bring out the relationships between them. We shall concern ourselves more with accurate observation of the features they offer than with explanation of them. The problems of the production and surface treatment of the B1, 2 and 3 wares are several and much confusion exists. This confusion is made worse by loose description and incorrect use of terms which have precise connotations.

BODY CLAY

Throughout the entire range of B wares the clays never exhibit the mica which characterized those of the A2 and 3. In general the clays which were selected were gritty, with a visibly larger particle size and high admixture of quartzitic sand. There is a tendency for the refractory content to grow in particle size with the passing of time, that of the Iron Age being smaller than that of the early historic, etc. This may be associated with progressive denudation of the landscape. It also seems quite certain that in most cases the sandy content was already in the clay which, in this area, was obviously from a secondary deposit. One of the results of the varying fineness of the clay is the relative increase in thickness of body from the B1 to B3 ware.

SHAPING

There is a sharp distinction between the processes employed in the making of B1 and B2, 3 and 4 wares. The former exhibits a series of techniques which cut it off from the main stream of Indian early historic and medieval pottery. In the B3 ware it is possible to trace its evolution from the early forms (found alongside the B1 ware in the cists and graves), through its high period (corresponding to the Brahmagiri Andhra) into a late period, scarcely represented at Piklihal.

B1 ware. The most distinctive feature of the B1 ware is its range of bowls. Probably none of them is wheel-thrown. The method of forming long perplexed me but recently we witnessed in the Deccan a modern technique, hitherto unrecorded, which appears to provide an explanation.[1] It involves the use of a very simple turn-table and a dabber. The clay is first rolled into a ball, beaten out on a slab as though it were a *chapātī*, lifted on to a concave sherd which rests in a ring stand or upper part of a large water pot, and while the potter turns the sherd with her foot she draws the walls up with her hands, holding against the clay a wet rag. This produces a very thin-walled vessel which when finished is lifted bodily in its forming sherd and put on one side to dry. The resulting bowl is so regular that it has every appearance of wheel-throwing; but the curved base reflects the curve of the sherd in which it is formed. Some of the other vessels of the red-and-black B1 ware may have been formed in a similar way, while others may have been partly made by this technique and finished by beating. The other characteristic forms of the B1 ware, the slender conical lids are scarcely found in our excavated material, they were probably thrown upon the wheel, often being removed, inverted and respun so as to finish off the top. A few of the bowls and other forms of the red-and-black ware may have been actually hand-made, and pinched out. This technique appears to have been employed by the makers of the pre-dynastic Egyptian red-and-black ware and is still employed in the Sudan in making its modern counterpart. It, too, can produce surprisingly regular bowls and small vessels with very thin walls.

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[1] cf. my paper 'Poor Men's Thālīs', *BSOAS*, XXI/2 (1959).

B2, 3 and 4 wares. There is a marked contrast between the bowls of the B1 and their counterparts in these wares. They often show flat bases, some with the marks still visible where they were cut from the wheel. Together with wheel-throwing comes an increase in the thickness of the walls and there is a greater tendency to standardization. It is probable that the older technique continued to be used for a few types of vessels. At the same time there was a proliferation of types from the limited range of the Iron Age to the multiplicity of the early historic. The large storage jars, water pots, etc., of the B3 ware show a wide variety of rim forms. They seem mainly to have been made by wheel-throwing and finished off by beating with the dabber and anvil. Some of the very large vessels were clearly hand-made: they were probably part ring built and part beaten, in much the same way as their modern relatives are made to this day in the Deccan. However the dominance of the wheel, for the manufacture of smaller and medium sized vessels is an important feature and probably may be taken to indicate a change from the earlier Neolithic and Iron Age techniques which were women's prerogative to the dominance of men in the potter's shop. The earlier techniques, whenever they have survived, are still carried out by women, the wheel work being solely done by men.[1] The other distinctively Indian technique of forming, the use of the dabber and anvil, continued apparently to exercise its influence (upon the spherical water pots, rounded bases, etc.) from the Neolithic period.

SURFACE TREATMENT

The B4 ware differs from all the other varieties of B ware in that it is without slip or dressing. The clay was generally left in the condition in which it came from the wheel. The B1, 2 and 3 wares, comprising about nine-tenths of the total studied, have all been treated with some sort of dressing which appears to be fundamentally similar in all three although the further treatments applied to the vessels differ.

The dressing appears to have had as a main constituent some sort of ferrous rich earth, earthy haematite, etc. It is generally so thin and even semi-opaque that to call it a slip appears to be incorrect, as there can have been little if any clay in it. However, some other ingredients may have been present, either in the substance chosen or added to it. In the case of the B1 ware the dressing may have been applied in a dry form and actually burnished on to the surface, or it may have been applied in liquid or tacky form and then burnished. In the case of the B2 and 3 wares the dressing was applied in liquid form, either by means of a rag or by dipping, and the burnish was omitted.

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[1] Compare also D. D. Kosambi: *An Introduction to the Study of Indian History* (1956), pp. 45-46. But *see* my comments in 'Poor Men's Thālis', *loc. cit.*

Burnish was applied universally to the B1 ware. It was of a different nature to that of the A ware, in that this used small single burnishing tools whereas the B1 ware is more thoroughly and completely burnished, probably by means of a string of beads, areca nuts, or some such thing. This technique has still a wide currency in South India and produces results not unlike those of the B1. Jagor, for example, gives this description of the modern practice: a red ochre (ferruginous) dressing was applied to the leather hard clay and burnished with a string of seeds with the addition of sesame oil.[1] Here the burnish was combined with an oil polish, and some such oil or gum may well have been used anciently and may account for the special features we shall notice below. The B2, 3 and 4 wares do not seem to have undergone any actual burnishing process. Here it suffices to note that at Piklihal the mucilaginous nature of the application and its subsequent burnish can be inferred on the great majority of sherds of B1 ware.

Tooling. The use of a tool to give greater sharpness to the form of the rim can be observed on vessels of the B3 ware. It is probable that this technique comes into the field during the early historic period, but certain rims of the Iron Age also appear to have been tooled. Similarly incised and thumb-nail decoration occurs on some rims from the Iron Age.

Painting. There are two types of painting noticed on pottery of the B1 and B2 classes. The B1 is extremely rare, not found at all at Piklihal and only a single example is known from the Raichur Doāb. It came from the earlier excavations at Maski and will be described in detail in a later volume. Here we may note that upon a typical B1 red-and-black bowl a white pipe-clay decoration in the form of lines of dots was added. The technique of this painting is a logical step towards that of the B2 'russet-coated' painted ware. Here the sequence of addition is as follows, first the standard dressing, next the white clay pigment, perhaps with an admixture of lime, and third the over-coat probably no more than a thinned variety of the under-dressing. The function of this over-coat was probably to promote the binding of the white clay to the surface of the body. The technique appears to be identical to that of the Coimbatore ware. Holder's views on the making of this ware can no longer be maintained.[2] Nor is there any clear evidence of double or biscuit firing. We shall consider the behaviour of the ware in firing, below.

FIRING AND THE RESULTS OF FIRING

Viewed in their totality the B wares show a more consistent temperature range than the A; that is to say that the extreme variations and numbers of ill-fired pots are not present. The actual firing range, depending as it does upon the kiln type, appears not to have been far different from the optimum range noticeable in the A wares: it was probably between 600° C. and 800° C. Once again we have no direct evidence of the potter's kilns from the periods under review but something can be inferred. The basic technique governing the results of firing was, of course, the control of atmosphere. Thus the B1 ware represents the oxidation of only parts of the vessel, the remaining parts being reduced. How this may be achieved seems to have presented archaeologists with unnecessary difficulty. Lucas, in his *Ancient Egyptian Materials*, has discussed the matter at length in connection with the Egyptian red-and-black ware and suggests several possible means. The most probable seems to be that the pots were fired inverted with their upper parts buried in cow-dung, etc., or latterly, as firing advanced, in ashes. Thus the inside and the upper portions of the rim became reduced while the lower parts of the outer surface oxidized. The oxidized parts turned to a typical red, occasionally verging on buff or orange, the reduced parts turned to black. The red-and-black B2 and B3 wares would have been fired in identical manner. The over-dressing covering the painted areas and surface of the B2 painted ware behaves in exactly the same way as the dressing of the B1. Where it covered the white paint and was fired in an oxidizing atmosphere it turned a pale orange-red, where it was reduced it turned a dull grey. However, as we have already mentioned, the white paint tended to flake away during firing, probably because of its thickness and different rate of contraction; and where this has happened the under-dressing is revealed. It usually differs from the final surface of the unpainted parts of the pot in being less intensely red, grey or black as the case may be, in just the same way as the undressed bodies of the B4 ware, being also made from an iron-bearing clay, exhibit an even less intense red-pink, and dull grey-black colour range. A large proportion of the B3 ware was fired entirely under oxidizing conditions. These pots are naturally entirely red. The precise nature of the red, black, etc., must depend upon the exact mineralogic content of the body clay, and slip or dressing. Again, some of the B1 ware were entirely black, or even occasionally all red.

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[1] *Verhandlungen der Berliner Gesellschaft für Anthropologie* (1878), p. 228ff.

[2] *Journal of Indian Art and Industry*, VII (1897).

In many vessels, both of the smaller B1 range and of medium size B3, the firing has been incomplete and 'black core' may be noticed in the body. This is probably due to the nature of the kiln and the short time for which the maximum temperature was maintained: the fault can be observed in much Deccani pottery of the present day. We must also notice the typical 'crackle' or crazing effect visible on the surface of pots of this ware. This appears to be what is referred to frequently as salt glazing. The term is misleading as salt glazing has a definite connotation in ceramic technology, referring to the throwing into the kiln of quantities of salt at the height of firing. There are several reasons why we must object to the term: the result, in European practice, is the production of a salt glaze upon stone ware, our pots do not have any such thing; the volatilizing point of salt is high (823° C.), probably higher than the maximum firing temperature of many of the crazed sherds from our collection, and in European practice the salt is thrown into the kiln at temperatures well over 1,100° C. The whole process is inconceivable in terms of the industry we are considering. It seems much more likely that the dressing applied had a different rate of shrinkage to the body clay, and that this together perhaps with the presence of small quantities of organic matter, salt or other fluxes, under the typical firing conditions of a bonfire or at best 'village' pit kiln, in which the temperature rose at some stages too steeply, resulted in the crazing. The effect is present upon nearly all the B wares. It is most noticeable on the larger vessels of the B3 class, less prominent upon the smaller B3 and 2 wares, and least prominent on the burnished B1 ware. However, a microscopic examination of a large number of sherds from Piklihal and other grave sites revealed that some evidence of crazing, often invisible to the naked eye, was present on nearly every piece. Another curious effect occasionally noticed is of a kind of bubbling or blistering. This is to be found on both B1 and B3 sherds.

FUNCTIONAL

As we have already noticed the amount of pottery of the B wares at Piklihal is small and the range of forms represented is correspondingly small. It does not represent the range which is known from other sites for either the Iron Age or the early historic period. For this reason we shall merely content ourselves with a summary of the various types and the probable functional groups to which they belong. We would recall the principles we used in arriving at the functional range of the various A ware types, particularly that each one of the fragments represents the relic of a vessel—the product of a potting tradition, the outcome of some social demand, perhaps during the fulfilment of which it became broken and abandoned. If the study of pottery is to mean more than a mere game of archaeological 'snakes and ladders', the functions of the pots must surely be considered.

B WARE

Functional group	*Type numbers*	*Suggested function or functions*
A	1, 2, 3, 4	Shallow open bowls, *thālī*, eating.
B	5, 6, 7, 8, 10	Deeper bowls, *kathorī* and *bāṭī*, eating, drinking.
C	9, 11, 12	Carinated bowls, ? cooking, eating, drinking.
D	13, 14, 15, 19	Small dippers, lids, covers, cups.
E	16, 17, 20–3	Other cooking vessels.
F	24–33	Narrow-necked jars, carrying water and other liquids.
G	25, 29, 34, 36, 60	Large jars, carrying and storage of water and grains.
H	39–41	Large storage jars.
J	42–3	Lids of B1 ware.
K	44	Sprinkler forms.

Once again it is interesting to notice the way in which certain wares are found in certain types only. This may be represented as follows:—

B1 ware: Types 1, 2, 3, 4, 5, 6, 7, 8, 10 (21), 25, 26, 27, 28, 31, 33, 42, 43.
B2 ware: Types 3, 6, 9, 10, 60.

B3 ware: Types 3, 9, 10, 11, 15, 18, 19, 20, 22, 23, 25, 29, 30, 31, 34, 35, 36, 37, 39, 40, 41, 43, 44, 45, 46.

B4 ware: Types 9, 11, 12, 13, 14, 15, 16, 17, 19, 24, 29, 32, 40.

B1–4 WARE

Type 1 is a shallow bowl of red-and-black ware (B1). *1a* comes from Site VII, layer 4; *1b* from the grave, Site IV; the other from a superficial layer of Site I. Comparable forms occur at many grave sites (Pl. 36).

Type 2 is a variant of type 1, of B1 ware. Types *2b* and *c* are wholly black. All come from superficial or disturbed layers. Comparable forms occur at Brahmagiri and Maski (Pl. 36).

Type 3 is a smaller variant of type 1. It occurs in B1, 2 and 3 wares. Comparable forms are found at Brahmagiri and Maski in both Iron Age and early historic levels.

Types	*Ware*	*Provenance*
Pl. 36, 3*a*	B1 red-and-black	VI layer 3
b	B1 black	VII ,, 0
c	B3 red-and-black	VII ,, 1
d	B2 painted	VIII ,, 1
e	B2 painted	VIII ,, 1

Type 4 is a unique example of a smaller variant of type 1, in B1 red-and-black ware from the entrance-way to the grave, Site IV (Pl. 36).

Type 5 is the first of several types of smaller bowl. It comprises a range of sizes down to very small examples which were perhaps used as lamps. All except *5h* are in B1 ware; *5a* and *b* are black only, the rest red-and-black. *5h* is in B4 black ware. A comparable bowl comes from the Brahmagiri town site (Megalithic),[1] and from Maski, Period II.[2] *5a* and *d* come from upper layers of Site VII; *5b* from the surface of Site VIII; *5c*, *e*, and *h* from Site VI; and *5f* and *g* from the grave, Site IV (Pl. 36).

Type 6 is another slightly larger bowl with curved sides. Three examples are in B1 black and red-and-black, the fourth in B2 painted. The latter, *6d*, comes from the surface of Site VIII and may be compared with one of similar ware from Brahmagiri.[3] *6c* is from Site VI, and *a* and *b* from Sites VIII and VII respectively (Pl. 36).

Type 7 includes deeper bowls with slightly rounded sides. Five of the six examples are of B1 ware, one of B2 painted. The form is common in the Brahmagiri cists,[4] and occurs both in the Iron Age and early historic levels in the town site.[1] Comparable B2 painted types are found in Period III at Maski,[2] Brahmagiri,[3] and at Chandravalli[4] (Pl. 36).

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[1] *Ancient India*, No. 4, *loc. cit.*, Fig. 24, T83.

[2] *Ancient India*, No. 13, *loc. cit.*, Fig. 22, Nos 5 and 6.

[3] *Ancient India*, No. 4, *loc. cit.*, Fig. 27, T139.

[4] *Ibid.*, Fig. 9, types C1, C2, etc.

Type 8 is a single example of a more conical bowl in B1 red-and-black ware. It comes from the excavation in the grave area (Site IV). The form is of common occurrence in Iron Age sites (Pl. 36).

Type 9 includes shallow bowls with slight shoulders: there is a marked difference between the B2 ware examples and the others. Compare Maski, Period II.[5] No analogies for the B2 painted variants have been yet reported.

Types	*Ware*	*Provenance*
Pl. 36, 9*a*	B3 red-and-black	VIIIB layer 2
b	B4 buff pink	VI ,, 1
c	B2 painted	VIIIA ,, 1
d	B2 painted	I surface

Type 10 is a small, deep bowl which makes its appearance at both Maski and Brahmagiri in the early historic period and occurs regularly as a surface find in sites of that date. At Piklihal three variants are in either B1 or B3, black and red-and-black; the fourth variant is a typical base of B3 black (10*d*); the final example 10*e* is in B2 painted ware, and comes from Site VIIIA, layer 2 (compare Chandravalli)[6] (Pl. 36).

Type 11 is a small cup or cover, usually of plain B4 ware. Its age is uncertain, probably early historic.

Types	*Ware*	*Provenance*
Pl. 36, 11*a*	B4 red	VIIIB layer 4
b	B3 red	VII ,, 1
c	B4 red	VIIIB ,, 4

Type 12 is a larger variant of type 11. The single example from Piklihal is of B4 pink ware, it comes from an upper layer of Site VII. Compare Brahmagiri T197, dating from the early historic period,[7] and Maski 18*d* of Period III[8] (Pl. 36).

Type 13 includes examples of curious little lids, cups or dippers mainly of B4 ware. It is not easy to find analogues.

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[1] *Ancient India*, No. 4, *loc. cit.*, Fig. 24, T80; Fig. 28, T155.

[2] *Ancient India*, No. 13, *loc. cit.*, Fig. 25, No. 2.

[3] *Ancient India*, No. 4, *loc. cit.*, Fig. 27, T131.

[4] *Ibid.*, Fig. 45, A1.

[5] *Ancient India*, No. 13, *loc. cit.*, Fig. 22, No. 18.

[6] *Ancient India*, No. 4, *loc. cit.*, Fig. 45, A2, A4.

[7] *Ibid.*, Fig. 30, T197.

[8] *Ancient India*, No. 13, *loc. cit.*, Fig. 27.

Types	*Ware*	*Provenance*	
Pl. 36, 13*a*	B4 pink	VI	layer 5
b	B4 red	I	surface
c	B4 grey/black	VI	layer 1
d	B4 pink	VIIIA	,, 1
e	B4 coarse clay, red/pink	VI	surface

Type 14 is a single example of another small cover of B4 red, coming from the late pit 3 in Site VII. Compare Maski 41 of Period II[1] (Pl. 36).

Type 15 is another variant of the lids or covers of dull B4 ware. The type occurs at Maski, in both Periods II and III, in similar ware.[2]

Types	*Ware*	*Provenance*	
Pl. 36, 15*a*	B4 buff	VII	layer 2
b	B3 red	VI	,, 2
c	B4 pink	VIIIB	,, 1

Type 16 is the first of several types of cooking vessels. It is in a curious ware of dark brown-red B4 with soot staining on the outer surface, and recalls several A ware types. It comes from an upper level of Site VII (Pl. 36).

Type 17 is a small cooking pot of B4 red from an upper layer of Site VII. Compare Maski, Period III, type 18[3],(Pl. 36).

Type 18 is a unique piece of B3 red resembling Chandravalli, A34,[4] and Maski type 13 of Period III.[5] It comes from pit 1, Site VII, layer 2 (Pl. 36).

Type 19 is a further small lid of rough pottery. It has no exact parallels at either Maski or Brahmagiri. 19*a* is of B3 red ware and comes from Site I, layer 4 ; 19*b* is of B4 ware and comes from the surface of Site VIII (Pl. 36).

Type 20 is a broad shallow basin probably used for cooking. It may be compared with type 14 of Maski, Period III.[6] Both examples are of B3 red ware and come respectively from layers 3 and 4 of Site V (Pl. 37).

Type 21 is a basin of red-and-black B1 ware, of poor quality, from Site VII, layer 3. Compare Maski, type 18*b* of Period III[7] (Pl. 37).

Type 22 is a variant rim of a basin, probably of similar form to type 20. It is in B3 ware and comes from Site VII, pit 3. Compare Maski, type 18*d* of Period III[8]; and Chandravalli, type M12[9] (Pl. 37).

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[1] *Ancient India*, No. 13, *loc. cit.*, Fig. 24.

[2] *Ibid.*, Fig. 23, type 27, and Fig. 26, type 7.

[3] *Ibid.*, Fig. 27, type 18.

[4] *Ancient India*, No. 4, *loc. cit.*, Fig. 47, A34.

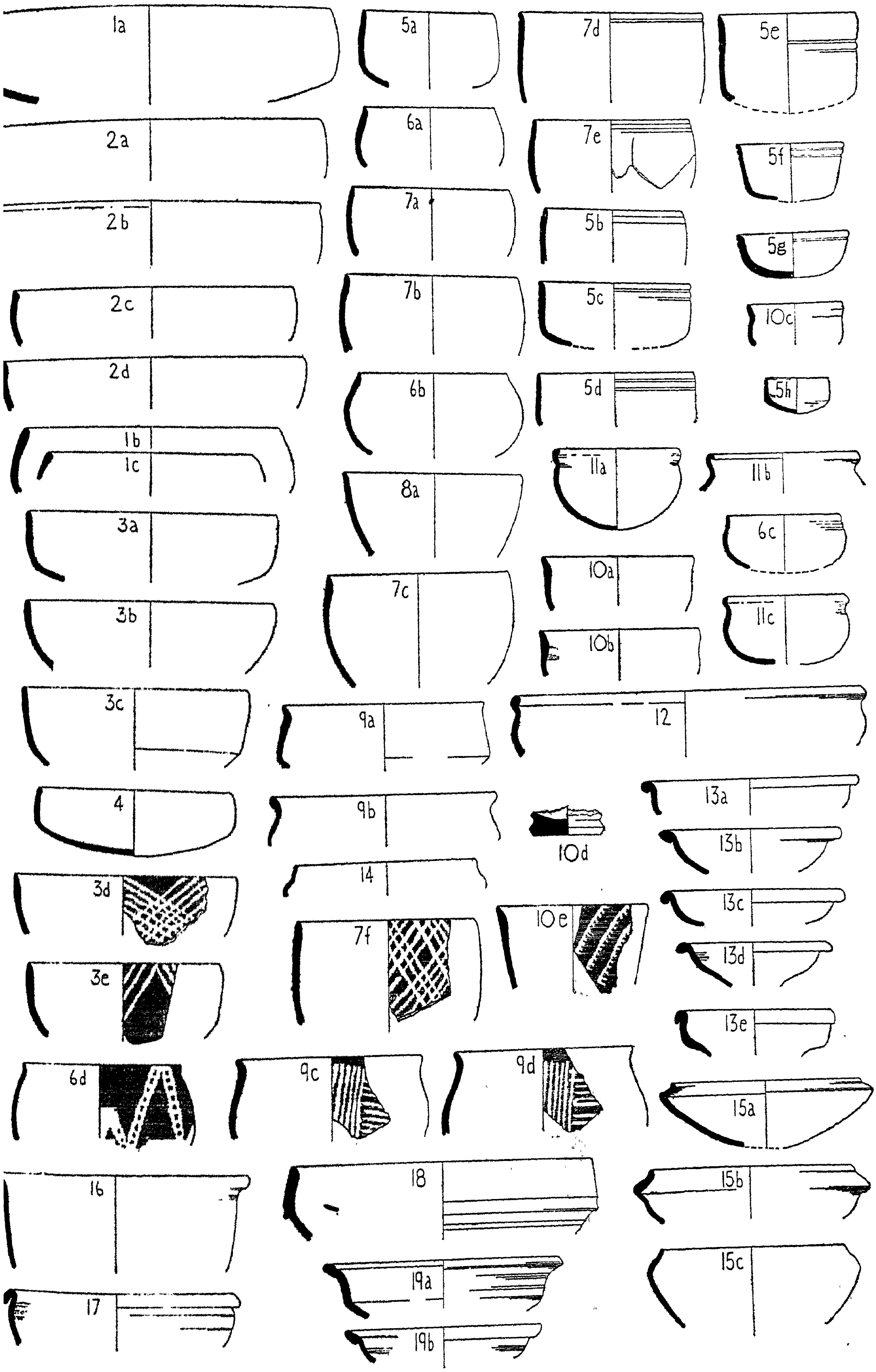
[5] *Ancient India*, No. 13, *loc. cit.*, Fig. 26, type 13.

[6] *Ibid.*, Fig. 26.

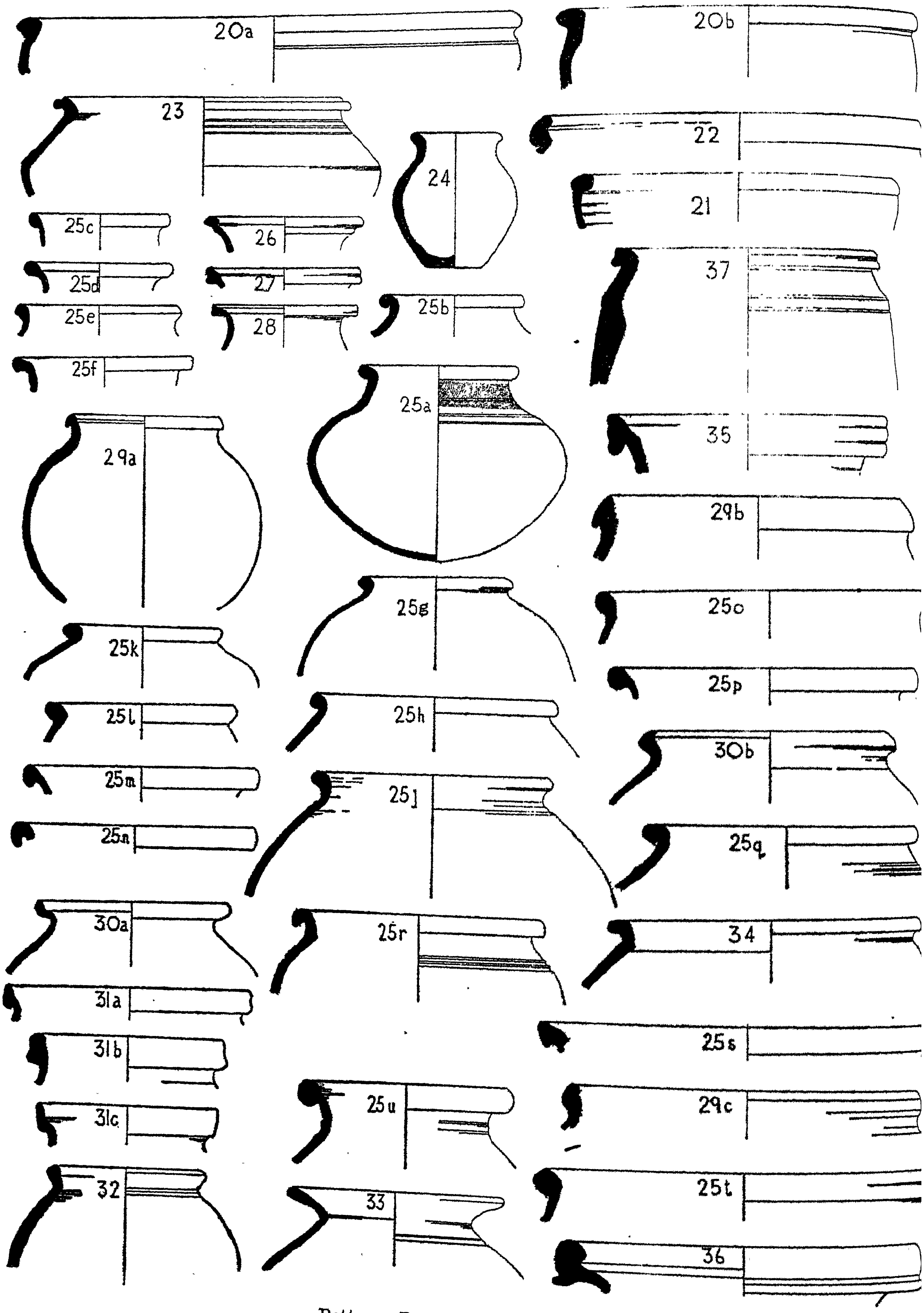
[7] *Ibid.*, Fig. 27.

[8] *Ibid.*, Fig. 27.

[9] *Ancient India*, No. 4, *loc. cit.*, Fig. 43.



Pottery: B1-4 wares (scale 1 : 4)



Pottery: B1–4 wares (scale 1 : 4)

Type 23 is a cooking pot with marked carination, of B3 red ware, coming from the surface of Site VIIIB. The type is common at early historic sites in the region. Compare Brahmagiri, type T177[1] (Pl. 37).

Type 24 is a small jar of B4 buff ware from the surface of Site I. Probably of early historic to medieval age (Pl. 37).

Type 25 is a common class of small narrow-necked jars, probably used for carrying water and other substances. It is common in B1 and B3 ware and rarely occurs in B4. Compare Maski, type B (iv) 3, and type 47, both of Period II.[2]

Types	*Ware*	*Provenance*	
Pl. 37, 25*a*	B1 red-and-black, from the entrance way to the stone circle grave, Site IV; it is of interest because the black appears as a band on the outer surface while the whole of the belly and the rim above the neck are in dull red	IV	layer 1
b	B1 red-and-black, from similar context	IV	,, 1
c	B3 red-brown	VII	,, 2
d	B1 red-and-black	IV	,, 1
e	B3 red	VI	,, 2
f	B1 black	VI	,, 1
g	B3 red	VIIIB	surface
h	B3 red	VI	layer 2
j	B1 red-and-black	VI	,, 4
k	B3 red	VIIIB	,, 3
l	B1 red-and-black	VII	,, 5
m	B3 red	I	,, 3
n	B1 red-and-black	VI	,, 2
o	B1 red-and-black	VII	,, 5
p	B1 red	VI	,, 2
q	B3 red	VI	,, 3
r	B3 red-brown	VIIIA	,, 1
s	B3 red	I	,, 2
t	B3 bright red	VII	,, 3
u	B4 (?) dull red-pink	VI	,, 1

Type 26 is a variant of type 25, of B1 black ware. It comes from a shallow pit in the natural moorum near the standing stone excavated in the alignment area, Site III (Pl. 37).

Type 27 is another variant of type 25 of B1 red ware from a similar provenance (Site III). Comparable forms occur in the cist graves at Brahmagiri and in the corresponding levels of the town site[3] (Pl. 37).

Type 28 is another variant of type 25 of B1 red-and-black ware from the same provenance (Site III). It is not an uncommon type of Iron Age date (Pl. 37).

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[1] *Ancient India*, No. 4, *loc. cit.*, Fig. 29.

[2] *Ancient India*, No. 13, *loc. cit.*, Fig. 20 and Fig. 24.

[3] *Ancient India*, No. 4, *loc. cit.*, Fig. 25, No. T115.

Type 29 is a more spherical vessel with a triangulate sectioned rim. The form occurs at both Maski and Brahmagiri, appearing first in the Iron Age and persisting into the early historic.

Types	*Ware*	*Provenance*	
Pl. 37, 29*a*	B4 red	VIIIB	layer 1
b	B3 red	VII	,, 4
c	B3 red	VIIIA	,, 1

Type 30 is yet another variant of type 25.

Types	*Ware*	*Provenance*	
Pl. 37, 30*a*	B3 red	VII	layer 2
b	B3 red	VII	,, 0

Type 31 another variant of type 25. Its earliest occurrence is in an Iron Age level.

Types	*Ware*	*Provenance*	
Pl. 37, 31*a*	B3 red	VI	layer 2
b	B3 red	VIIIB	unstratified
c	B1 brown-and-black	VII	layer 5

Type 32 is a unique variant of type 25, of buff-red B4 ware, from Site VIIIA, layer 1. It is probably a late stray (Pl. 37).

Type 33 is a rim of a similar formed pot of red-and-black B1 ware. It comes from a pit in the surface of the natural moorum in the alignment area, Site III. Compare type B (iv) 4 from the Maski graves[1] (Pl. 37).

Type 34 is a unique variant of type 25 of dull red B3 ware, from Site I, layer 2. It was found with quantities of similar fragments which appeared to be the remains of late ash inurnments and probably dates from the early medieval period (Pl. 37).

Type 35 is a unique example of B3 brown-and-black ware from Site VIIIA, layer 1. No form strictly comparable is reported at either Brahmagiri or Maski. Probably a stray of early medieval date (Pl. 37).

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[1] *Ancient India*, No. 13, *loc. cit.*, Fig. 20.

Type 36 is a rim of a large storage jar of B3 red ware. It also comes from the surface of Site VIII. Compare Brahmagiri type T191 of the early historic period[1] (Pl. 37).

Type 37 is another unique form of jar with wide mouth in B3 red ware from Site VII area. No comparable form is reported at either Brahmagiri or Maski, but type 135 from Arikamedu provides a near analogy.[2] Probably early historic (Pl. 37).

Type 60 is a unique reconstruction of the upper part of a vessel of B2 painted ware (Pl. 38). The fragments were found in the surface humus of the enclosed Area D of Site VIII. The body clay has burnt to a typical black. The surface of the inside and the rim down to the top of the painted register is black: from there downwards to the lowest surviving parts the body is a deep red. Below the rim are two bands the upper of incised nail impressions, the lower of broad triangular incisions. Below the painted register are two further bands, an incised herring-bone pattern and an *appliqué* band with broad finger-tip impressions. The painting is in white clay under a typical red over-coat. In the centre of the surviving portion stands the figure of a man: the arms are hanging down with the fingers outstretched, depicted in a manner recalling the tails of some rock painted bulls; the hair is shown by three blobs of pigment, the feet are shown moving to the left. Below the right hand is a small creature, apparently a goat, not unlike certain goats depicted in the rock paintings at 'P'. In the extreme right of the fragment there is a large six-spoked wheel with a curved line above it. Between these two groups is a typical B2 painting technique, repeated bands of small chain-like lines. A similar panel separates the central figure from the left-hand group, which is even more enigmatic. Here the central motif appears to be a small structure with a dome-shaped roof, above the structure is a mast from which flies a fish-shaped banner; to the right a six-pointed star; above the banner an, unhappily, incomplete object. It is certainly tempting to regard the central figure as either a divinity or priest about to sacrifice a goat. The left-hand group appears to represent the shrine of the divinity (Pl. 38).

Nothing comparable to this vessel has hitherto been reported, but the form is not altogether unknown. In the former museum at Maski several large shoulders of vessels of this size and decorated with the same incised bands, also of B2 painted ware, were noticed, although none had the interesting scenes depicted on the Piklihal example. They all came, not from Maski, but from graves in the Benakal forest. The exact circumstances of their discovery I was unable to learn.

Type 38 has already been described under AB ware above (p. 60) (Pl. 39).

Type 39 is a rim of a large storage jar with a wavy impressed pattern around its lower margin. It is in typical B3 red ware and comes from Site VIIIA, layer 1. A somewhat similar form is reported at Brahmagiri from early historic levels[3] (Pl. 39).

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[1] *Ancient India*, No. 4, *loc. cit.*, Fig. 30.

[2] *Ancient India*, No. 2, 'Arikamedu', Fig. 35, No. 135.

[3] *Ancient India*, No. 4, *loc. cit.*, Fig. 29, T179.

Types	*Ware*	*Provenance*	
Pl. 33, 60	A3 red lug from bowl of type similar to 58. The lug is of triangular form	VIIIA	layer 4
61*a*	A3 red lug from similar bowl	VII	„ 9
b	A3 light burnt sienna dressing, burnished inside, from a similar bowl (illustration is mounted inverted)	VII	„ 11
c	A3 red lug from similar bowl	VII	„ 11

Type 62 includes circular sectioned handles (?) from unknown vessels. At first I was inclined to think that they might be parts of terracotta bulls similar to the A3 ware specimens discussed below, but in the end it seems more probable that they are either handles or else parts of some looped stand. 62*a* has still a part of the wall of a vessel, probably of type 58, at one end and a scar at the other. The form is peculiar to the A3 ware and to the Lower Neolithic. No comparable forms are reported at other Deccan sites.

Types	*Ware*	*Provenance*	
Pl. 33, 62*a*	A3 red handle, wall of pot of similar ware at one end	VII	layer 10
b	A3 red handle, similar to above	VII	„ 11

Type 63 includes legs of stands and horns of terracotta bulls of the A3 red ware. (*See also* Pl. 41*a*.)

Types	*Ware*	*Provenance*	
Pl. 33, 63*a*	A3 red leg of terracotta from stand of type 59	VII	layer 11
b	A3 red shorter curved horn of terracotta bull	I	„ 12

Type 64 includes two bases of small vessels of unknown form. 64*a* is in a ware which may well be a late survival of A3, with very thin red dressing and non-micaceous clay.

Types	*Ware*	*Provenance*	
Pl. 33, 64*a*	?A3 red, base of small vessel of (?) type 20	VII	layer 4
b	A3 red base	VII	„ 9

Type 65 is a unique piece of probably very late (i.e. Upper Neolithic) imitation of A3 ware, a surface find. It is part of the base of a broad shallow bowl

Type 40 is a very large storage jar. A somewhat comparable form, although smaller, comes from Maski, Period III.[1]

Types	Ware	Provenance	
Pl. 39, 40*a*	B3 red ware	VIIIA	layer 1
b	B4 dull brown-buff	V	unstratified

Type 41 is a variant type of storage jar in B3 red ware. It comes from the pit 3 of Site VII (Pl. 39).

Type 42 includes the upper portions of typical B1 black ware lids. None of these types is unique and all may be found in numerous reports of grave sites: examples were found near Piklihal by Captain Munn in his excavation of graves in Lingsugur tank, and other examples occurred in graves at Maski, in the earlier excavations. The curious feature about the present series is that they come from the Area 'A' between Sites VI and VII. Whether they can be taken as indications of the presence of graves in this area, high among the settlements, is doubtful, but they have hitherto been reported only in graves.

Types	Ware	Provenance	
Pl. 39, 42*a*	B1 black ware	Area A	surface
b	,, ,, ...	,,	,,
c	,, ,, ...	,,	,,
d	,, ,, ...	,,	,,
e	,, ,, ...	,,	,,

Type 43 are the lower parts of related lids. Similar forms come from grave surface collections at several sites in the district.

Types	Ware	Provenance	
Pl. 39, 43*a*	B1 black ware	Area A	surface
b	B1 red-and-black ware	VII	layer 0
c	B3 red ware	IX	,, 2

Type 44 are parts of local imitations of the red polished ware sprinklers, which during the early historic period were imported into the district. They were immediately imitated by local potters.

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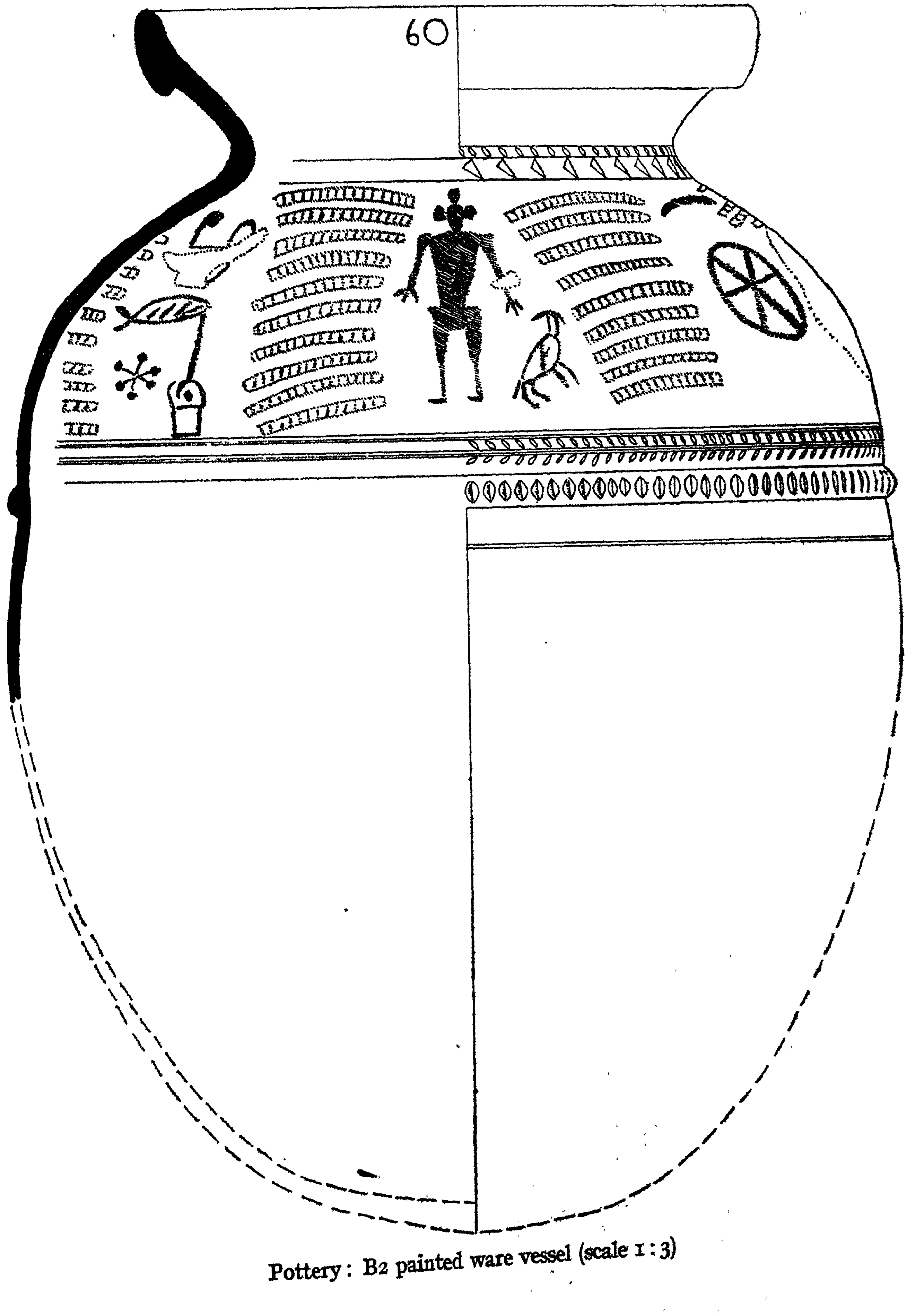
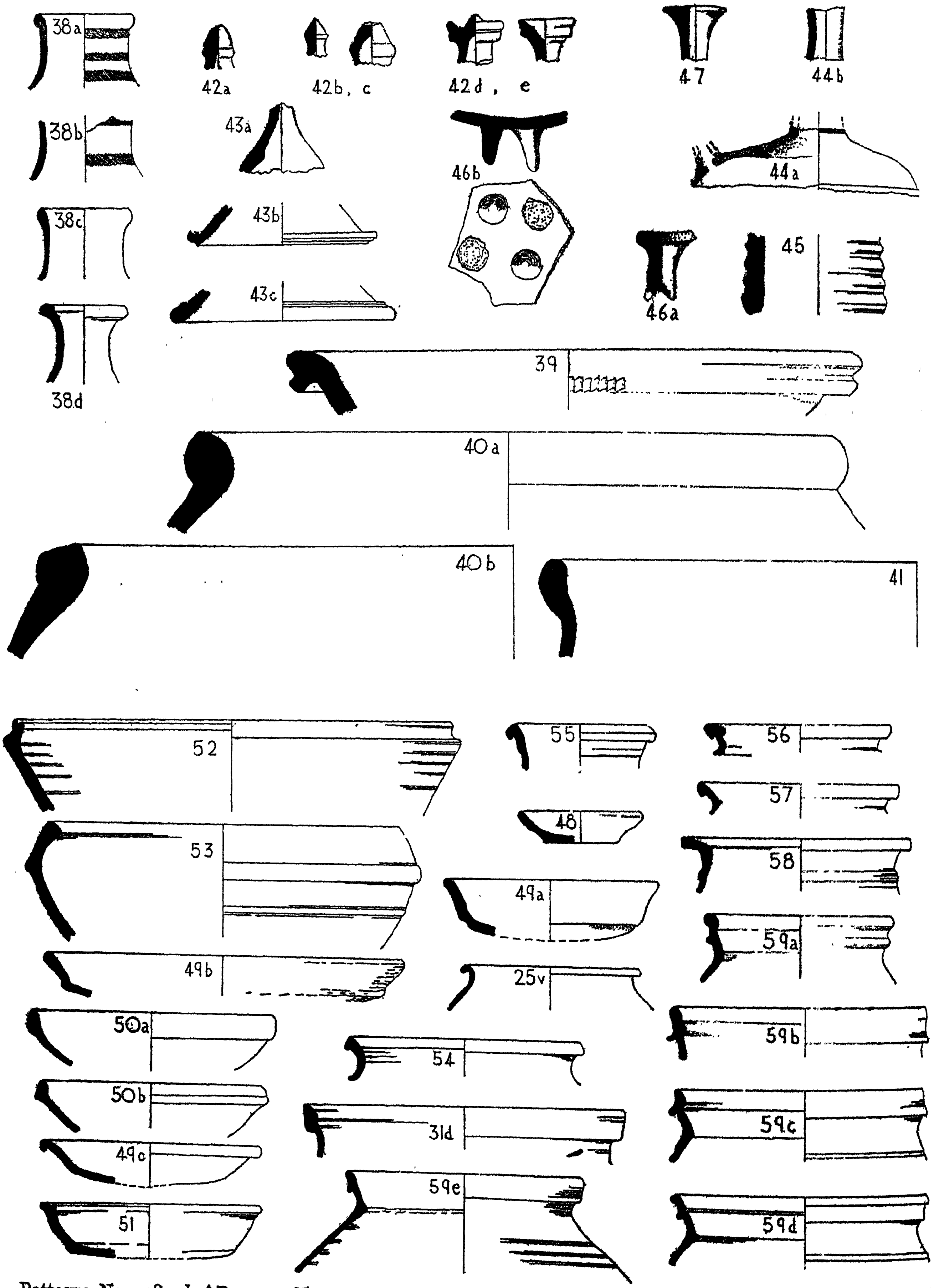
[1] *Ancient India*, No. 13, *loc. cit.*, Fig. 27, No. 30.



Pottery: B2 painted ware vessel (scale 1 : 3)

PLATE 39



Pottery: Nos. 38*a–d*, AB ware; Nos. 42*a*–41, B ware; No. 47, C ware; and Nos. 52–59*d*, D ware (scale 1:4)

Types	*Ware*	*Provenance*	
Pl. 39, 44*a*	B3 red ware, upper portion of a sprinkler with the long neck missing, and with stump of broken spout. The piece is clearly a locally made imitation of the true red polished ware, pieces of which were found at the site	I	layer 3
44*b*	A small cylindrical portion of the neck of such a sprinkler. This piece is of a very fine B3 ware, of a type which is itself foreign to Piklihal and likely to be imported. It is not, however, a true piece of red polished ware	VIIIB	„ 3

Type 45. A unique corrugated cylinder of B3 red ware. In view of the occurrence of such a form at Hastinapur[1] and various other sites, this is illustrated, although it may here belong to the early historic period. A piece of similar form and ware is in the Sanchi Museum. Site I, surface (Pl. 39).

Types 46a and b. Two examples of small feet of B3 red ware. They are reminiscent of similar feet from the A ware (p. 44), and come from the same provenance as type 45 (Pl. 39).

C. IMPORTED (C) WARE

At Piklihal only a single sherd of definitely imported ware was discovered. Although it might have been expected that the Rouletted Ware would be found, no pieces either of genuine ware or of local imitation were discovered. A single sherd has been noted above (No. 44*b*) as being of a fine imported variety of B3 ware. At several sites in the district sherds of this ware have been discovered, some actually bearing rouletted marks, but they remain imitations of the true ware, and their place of manufacture is unknown: it may well have been in the Raichur Doāb itself. The single sherd is a piece of true Red Polished Ware, the upper part of the neck of a typical sprinkler (*Type 47*). It bears a very close resemblance to the clay and surface finish of sprinklers apparently manufactured near Kondapur, to be seen in the Kondapur Museum, and may well have been imported from that site. As the Red Polished Ware has been exhaustively treated by Subbarao[2] and as it has already been noticed at Chandravalli by Wheeler we shall not add more here.

Types	*Ware*	*Provenance*	
Pl. 39, 47	C1 ware, 'red polished' ware, part of neck of sprinkler.	Area A	surface

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[1] *Ancient India*, Nos. 10 and 11, 'Excavation at Hastinapura', Fig. 13, type XLV.

[2] *Baroda through the Ages* (1953), pp. 56–62.

D. MEDIEVAL TO MODERN (D) WARES

When in 1952 I was surveying sites in Raichur I had occasion to notice that at many sites pottery belonging essentially to the modern potting tradition of the region could be obtained. At that time this pottery was, archaeologically, quite unknown, but by a process of elimination it could be seen that the earliest sites at which it was found dated from about the time of the Muslim invasions of the Deccan, or slightly earlier. As we have already noticed, during the excavations at Piklihal a very small pit was excavated in the medieval settlement area, so as to complete, as far as possible within the tiny scope of our work, the archaeological story of the site. The pottery from this area mainly belongs to this medieval-modern tradition, to which we give the name D ware. It is obviously not necessary to make so thorough a study of its techniques of manufacture as of the earlier wares, as a visit to a modern potter's shop in the region could provide an account of the various stages of the work. However, since I have not been able to study the whole modern process, it seems worth while repeating the analysis I made in 1952-3 for my thesis of the land.

BODY CLAY

The body clay of the period resembles that of the B wares, but there is a slight tendency, already noted, for the refractory content to increase. This may well be due to progressive denudation of the land.

SHAPING

The vessels are all wheel-thrown, with the exceptions of large hand-made storage tanks, etc. There is a tendency towards lighter bodies than those of the B ware, particularly in its latest, early medieval phase. The use of the dabber and anvil and the beating of round-bellied pots continues as one of the features of the industry. The range of forms found at Piklihal is, as we shall see, very restricted.

SURFACE TREATMENT

The surface is as a rule left as it comes from the wheel. A certain number of pots seem to have been treated with a slip made of the identical body clay, but it is probable that they are rather smears than slips. Burnish was never employed in any of the specimens.[1] The surface often bears evidence of smearing, probably with a wet rag, while still fresh from the wheel; but there is no evidence of a burnishing tool being used while the pot was leather hard. Vessels when decorated mainly bore incised lines, rows of notches, lines and triangles. Comparable decoration appears on pottery of the Bahmani period from Kohlapur.[2] All these decorative motifs were present in pottery of the early historic period and are merely reused, sometimes with new emphasis. Another type of decoration, noticed on medieval pottery at several sites in the district, but not seen at

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[1] Here I find it hard to understand Mr. Thapar's statement that the modern potters of the area *burnish* with ash. I have never seen them doing so, or found evidence of such burnish. (*Ancient India*, No. 13, p. 82). Ash is today used by Deccan potters as a grog.

[2] Sankalia and Dikshit: *Excavations at Brahmapuri, Kohlapur* (Poona, 1952), p. 56.

Piklihal, was the application of small stamped rosettes, and other patterns, which seem to have been derived from the B3 stamped wares so richly represented in the earlier excavations from Maski and dating back to Satavahana times.

FIRING

The firing rate is much the same as for the B wares, and the suggestion is that the modern kiln type was in use, at least since the beginning of the early historic period, if not earlier. But the ware is clearly differentiated from the B, not only by the absence of typical surface dressing but by its being fired throughout in a reducing atmosphere. The resulting colour ranges from buff-brown to grey and black. The normal practice today is to close the kiln during firing, thus producing the grey, buff-brown and black surfaces which are admired. It is strange that this reduced pottery should have such a wide vogue, and that it should have replaced the predominantly red, oxidized, fashion which flourished throughout the first millennium.

FUNCTIONAL

The range of forms is very much reduced by comparison with those of the B ware. This, however, may be partly illusory for the modern potters make a much wider range than those represented at Piklihal. It may be that the limited area of the excavation is responsible, although the surface collections in the district produced a nearly similar range. The two basic types are shallow carinated bowls which may have been used as food bowls, cups and covers for storage pots, and spherical water pots. It is probable that metal vessels took over many of the functions earlier filled by earthenware.

Types	*Ware*	*Provenance*	
Pl. 39, 25*v*	D ware grey, gritty clay (compare B ware, type 25 above, Pl. 37)	I	surface
31*d*	D grey (compare B ware, type 31 above, Pl. 37) ..	V	layer, 5
48	D ware grey, small saucer	V	,, 3
49*a*	D ware grey-brown, shallow bowl	VIIIB	pit 1
b	D ware grey-brown, compare Maski, type 1*b*[1] ..	V	layer 3
c	D ware grey, compare Maski, type 2*b*[2]	V	,, 3
50*a*	D ware grey, ,, ,, ,, ...	V	,, 5
b	D ware grey	V	,, 3
51	D ware grey	VIIIA	surface
52	D ware grey, a larger bowl	VIIIA	layer 1
53	D ware brownish-red, approximating to very late B4 ware, compare B ware, type 18 above, Pl. 36 ..	I	surface
54	D ware dark black-grey, compare B ware, type 30 above, Pl. 37	V	layer 5
55	D ware buff, approximating to late B4 ware ..	I	unstratified
56	D ware grey; compare Maski, type 15[3]	I	surface

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[1] *Ancient India*, No. 13, *loc. cit.*, Fig. 28.

[2] *Ibid.*

[3] *Ibid.*

Types	*Ware*	*Provenance*
Pl. 39, 57	D ware grey	I surface
58	D ware grey (compare Brahmagiri, T178 which is perhaps also of this ware and period)[1]	I ,,
59*a*	D ware grey. The rims of type 59 are one of the most common features of the ware. A characteristic feature is the lightness of the body clay, the regularity of their form can be traced back to beginnings in the early historic period. Compare Maski, type 16[2]	V layer 3
b	D ware grey	V ,, 3
c	D ware grey	V ,, 3
d	D ware grey	V ,, 3
e	D ware grey	V ,, 3

2. TERRACOTTA OBJECTS

One of the least expected and most exciting products of the Piklihal excavations was a group of terracotta figurines from the Lower Neolithic levels. As these were chiefly humped bulls and as the earliest types were followed by obvious degenerations in later levels they appeared to reinforce the evidence of the animal remains and to indicate the pastoral nature of the Lower Neolithic economy. They also seemed to provide powerful circumstantial support for the hypothesis that the oldest of the rock bruisings and paintings could go back to the Neolithic period, as certain features of the bruisings were closely repeated in the figurines. We shall first briefly outline the technical features the terracottas present, then list them, and finally consider the comparative material.

TECHNOLOGY

The methods employed in making, finishing and firing terracotta figurines may be more or less related to the techniques of the potter. There are certain examples which, whether manufactured as toys or icons, bear witness to homely techniques and which may even be unfired. It is difficult, perhaps, to link these to the potting tradition; but there are others, and at Piklihal they are the majority, which, whether actually the product of the potter himself or of some other, employ many of his current working techniques. It is only necessary to cite the red surfaced terracottas of Kushān times in the Ganges valley, or the totally different double-moulded terracottas of Sātavāhana sites, to realize the close links which bind them to the contemporary Ganges valley red ware or the Red Polished moulded bowl tradition of such sites as Kondapur. For terracottas which exhibit features common to the potting tradition we shall employ a ware-name linking their manufacture to the ware. We have from Piklihal no examples of B ware or C1 ware terracottas but among the rich hoards from the earlier

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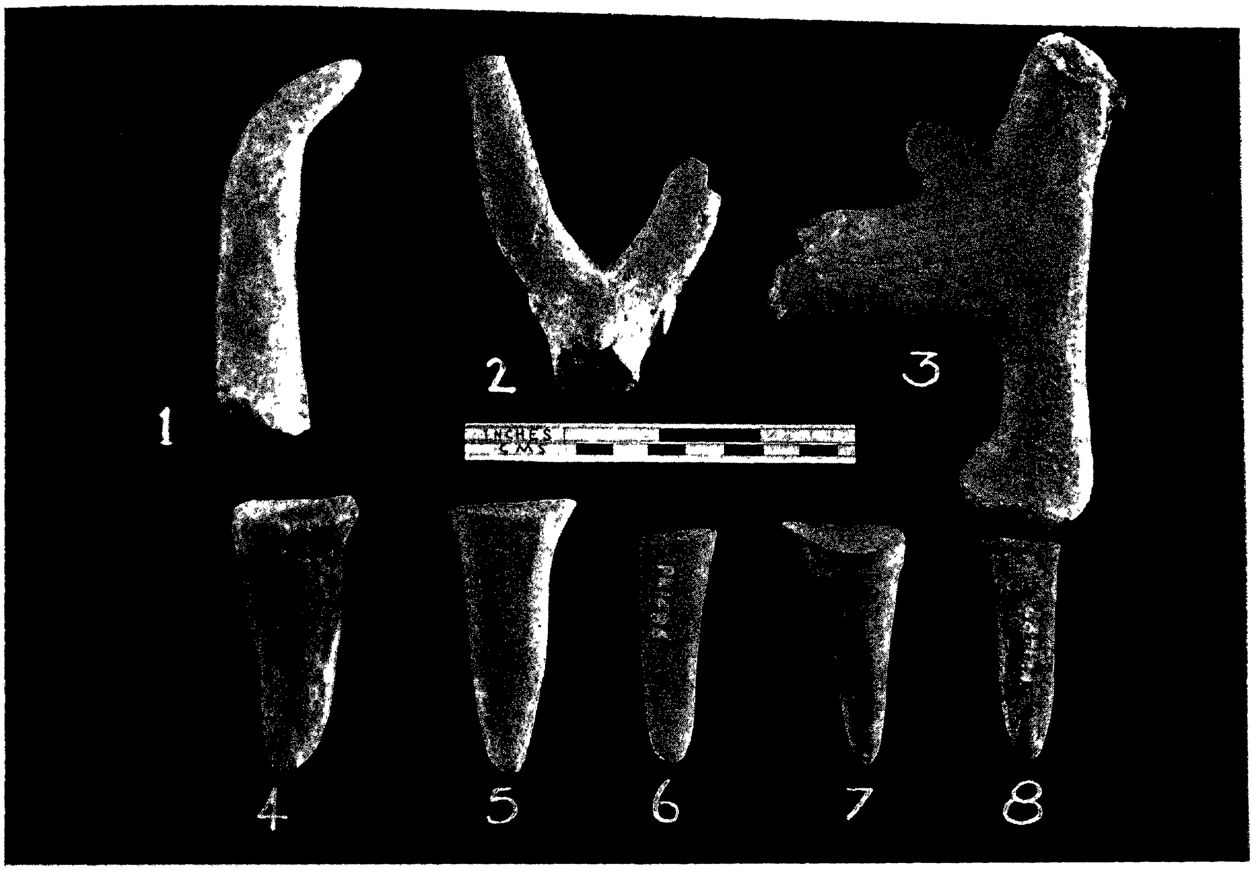
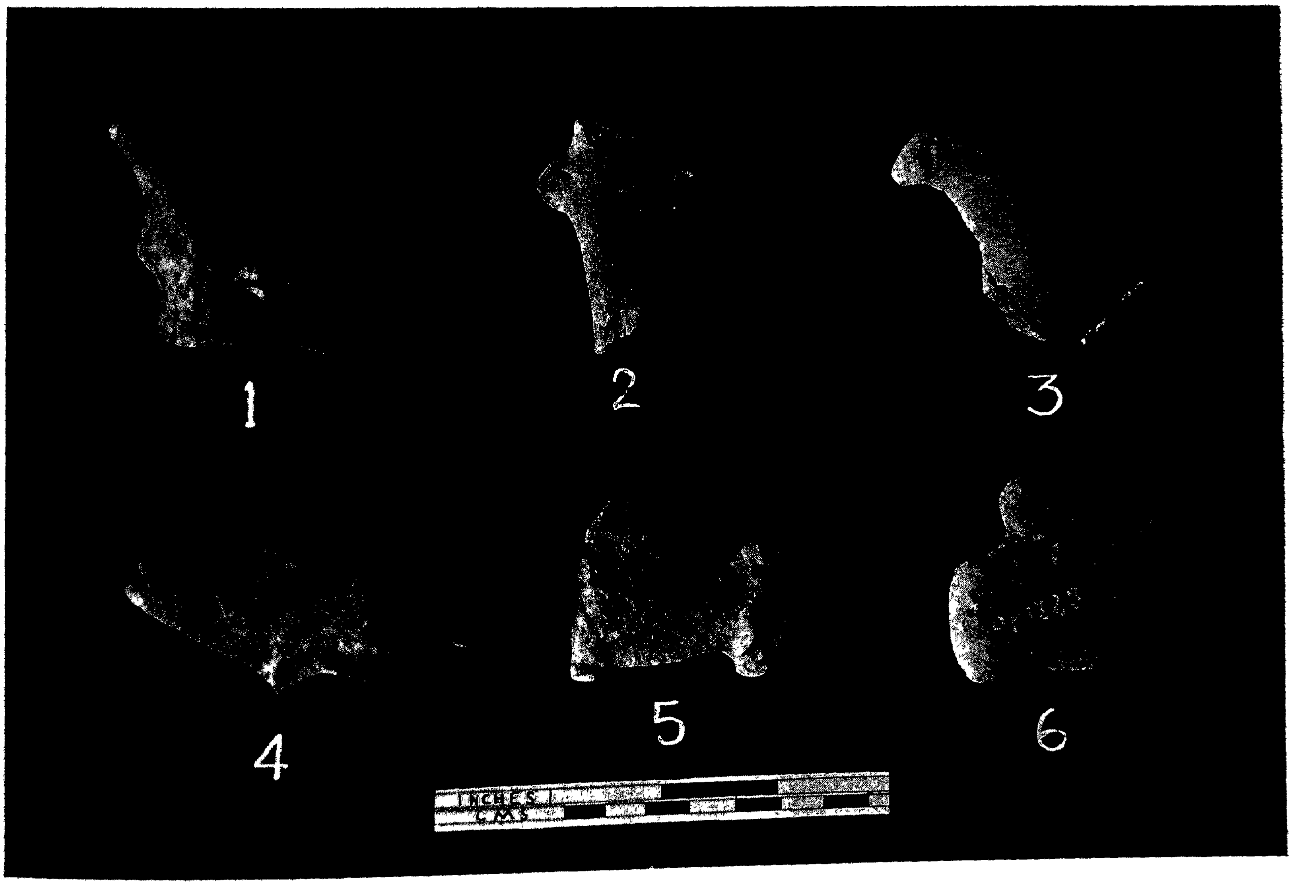
[1] *Ancient India*, No. 4, *loc. cit.*, Fig. 29.

[2] *Ancient India*, No. 13, *loc. cit.*, Fig. 28.

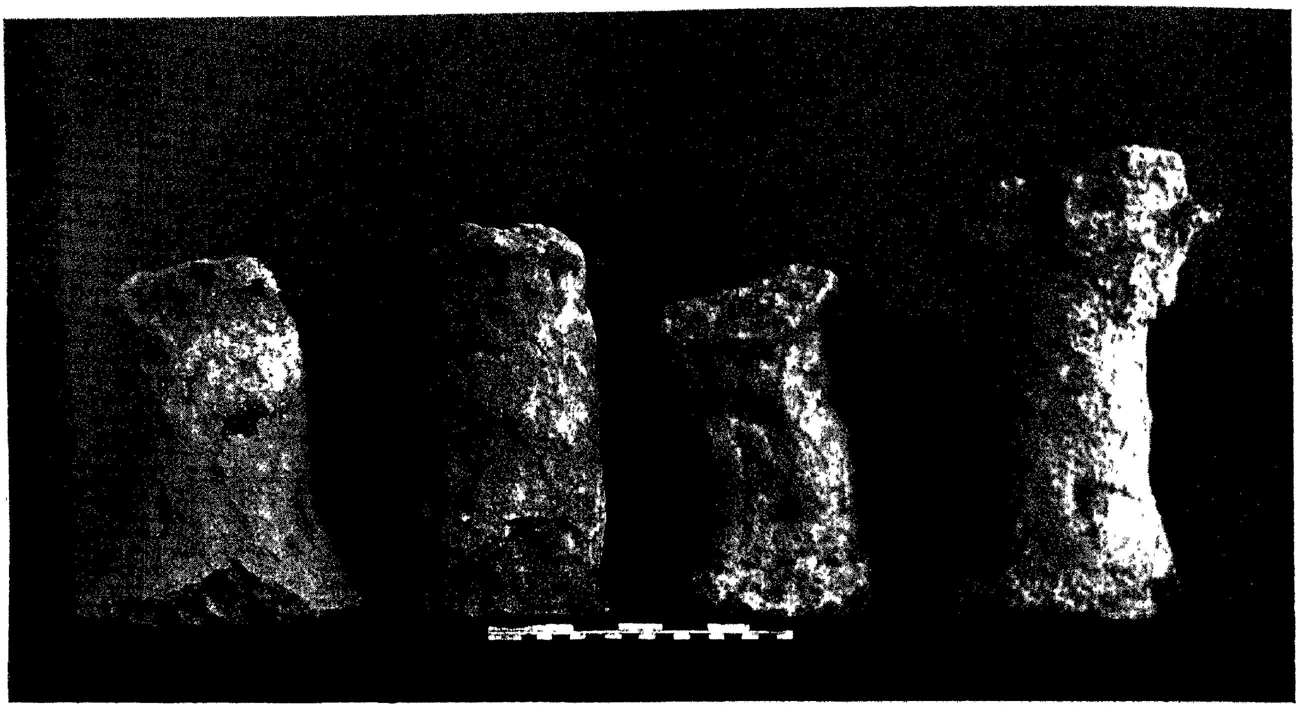
PLATE 41



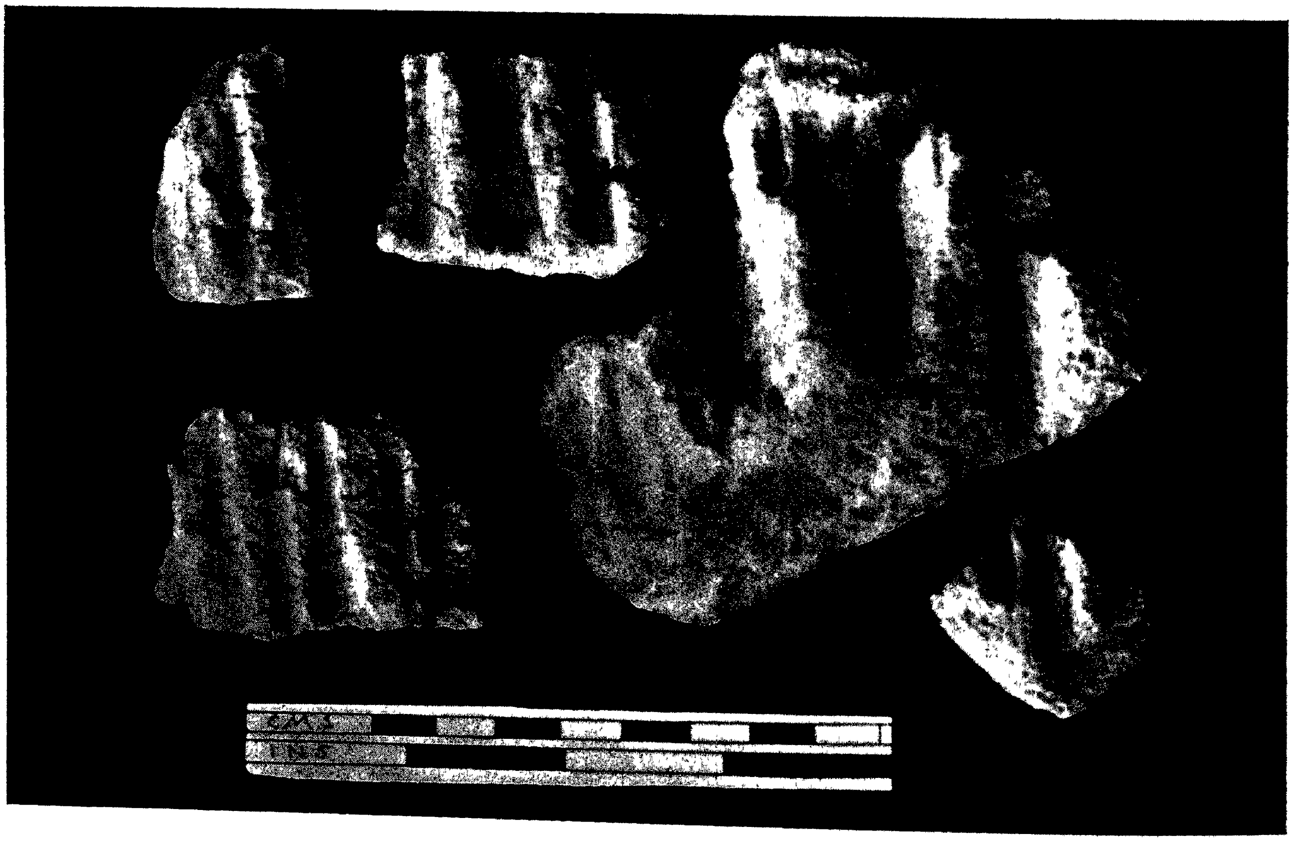
(*a*) Nos. 1–3, A3 red ware terracotta bulls; Nos. 4–8, A3 red ware legs of stands



(*b*) Nos. 1–6, A1 ware terracottas



(*a*) Terracotta theriomorphic legs



(*b*) Fragments of burnt daub

excavations at Maski there are many examples, some of which we shall consider in a later volume.

The remaining examples may be broadly divided into two groups: an earlier A3 ware and a later A1. Technologically there is little to distinguish the groups except the surface treatment: morphologically the later group can be easily recognized. Throughout the whole range the figures were hand-modelled. The only tool to be employed was a stick used to make incisions to indicate eyes, nostrils, etc. The horns and perhaps individual parts of the early group were rolled out under the hand and then luted together; the humps and heads of the bulls were also luted on. In the A3 ware group the clay is typically micaceous, although not perhaps universally. In the later group, as in much of the A1 ware, the clay is more gritty and the mica element is not in evidence. The A3 group have also been treated with a typical red dressing and in some cases burnished. In other cases the burnish appears to have been dispensed with.

Morphology

Within the specimens we may recognize certain types. The chief is the bull. In the earliest examples the horns are long and curved, the hump and nose indicated by small additions, the fore legs, and probably the rear legs also, are represented as a single cylinder (Pls. 40 and 41, 2-3). In later examples the size is reduced, the whole treatment is cruder and more compact, the hump and horns tend to be of exaggerated size (Pl. 40, 4, 5, 8). The second type is a small bird standing with closed wings. A third type is a human torso, apparently male, and possibly originally ithyphallic. A single surface find is a head which could be that of a bull or more doubtfully a horse. The size and original positions of the terracottas are problematic. The Lower Neolithic examples would not have exceeded eight inches in length or height and apparently had some sort of stand or solid base. One of the small, later, examples was apparently pressed, before firing, on to some rounded body; another, of a curious animal's head, was likewise attached. However, in the surface collection there are various pieces which appear to have belonged to considerably larger figures, but it will require further, more extensive, excavations to find evidence of their nature.

(*a*) ***Figurines from the excavations:***

1. **Terracotta horn apparently broken from a humped bull, of black micaceous clay with red dressing, typical A3 ware (Pl. 41*a*, 1 and Pl. 40, 1)**
Site I, layer 12

2. **Horned head of a bull, the head is a small beak-like addition, the eyes are indicated by stick impressions, the ears by small additions. The neck and lower parts are missing. The clay is typical black micaceous, the surface dressing typical red, A3 ware (Pl. 41*a*, 2 and Pl. 40, 2)** .. .. Site VII, layer 10

3. **Forepart of a similar bull, of similar ware. The hump is an addition, the horns and head are broken off. The trunk and front legs are represented**

as single cylinders. At the foot of the legs the clay thickens, as if it had terminated in some sort of stand. (*N.B.*—This cannot belong to the same animal as No. 2 above.) (Pl. 41*a*, 3 and Pl. 40, 3) .. .. Site VII, layer 10

4–18. A group of broken-off horns and legs of legged stands of A3 red ware (compare pottery, A ware, type 59), some apparently from bulls and others from stands. The manufacture and ware of both types is identical, but the legs show a typical flattening where they were joined to the stand. Three of the specimens are without red dressing or burnish and are therefore classified as A1 ware (Pl. 41*a*, Nos. 4–8) .. .. Site VII, layer 10

19. Head of some unrecognizable animal, the mouth is indicated by an incised line, two scars on the upper surface seem to indicate that there were originally horns, but it is not like the usual bull's head. The lower side has a concave impression of some body on to which the thing was originally luted. Typical micaceous clay with buff surface, no dressing, A1 ware (Pl. 41*b*, 4)
Site VII, layer 10

20. A very crudely modelled piece of clay, only very lightly burnt, apparently representing a bull with exaggeratedly large hump and with head and horns missing (Pl. 41*b*, 6) .. .. .. Site VII, layer 9

21. Well modelled hump of a bull of micaceous clay with red dressing and traces of burnish (A3) .. .. Site VII, layer 10

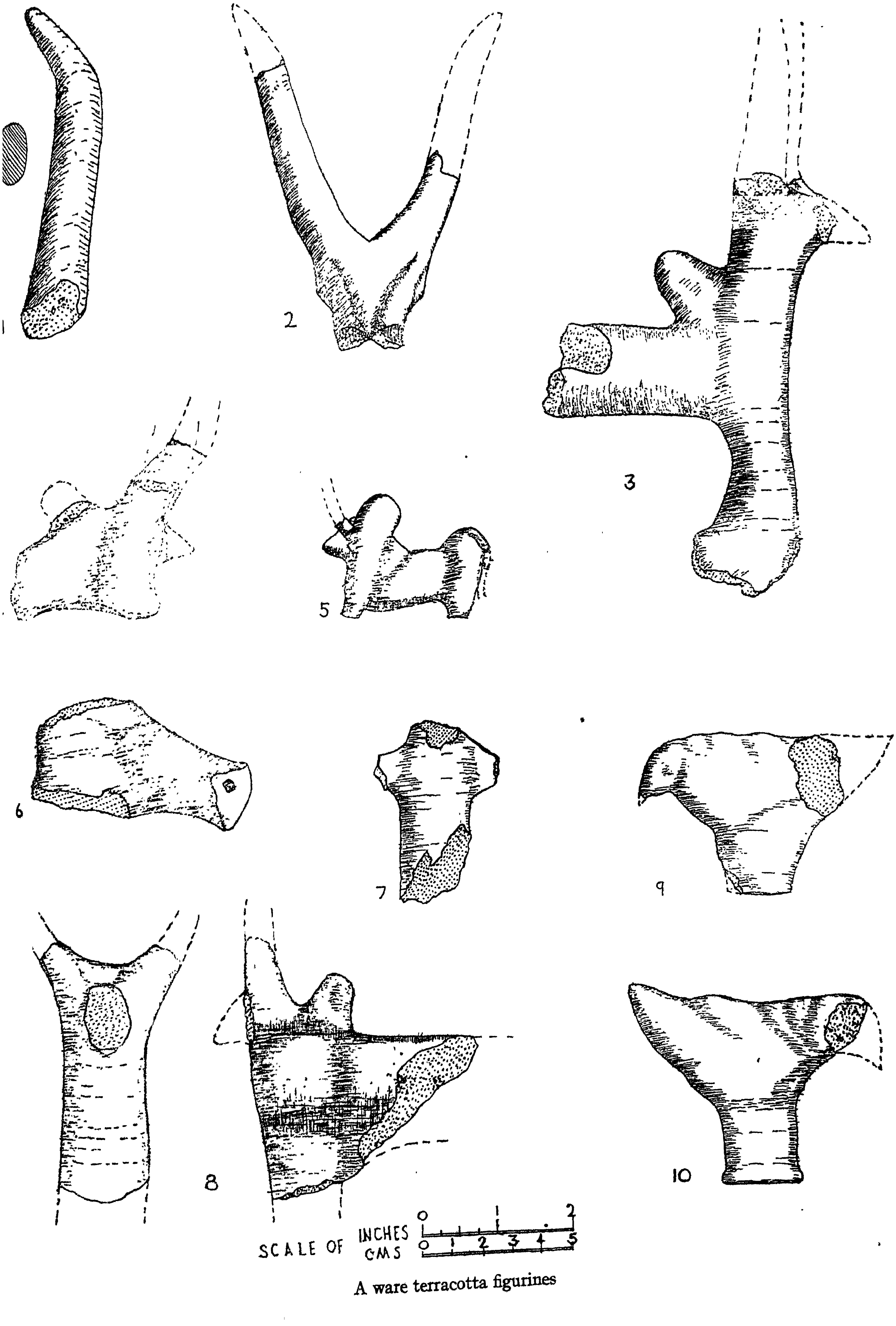
22. Horn of A3 red ware similar to 6 above Site VIIIA, layer 4

23. A similar horn of similar ware .. .. Site VII, layer 8

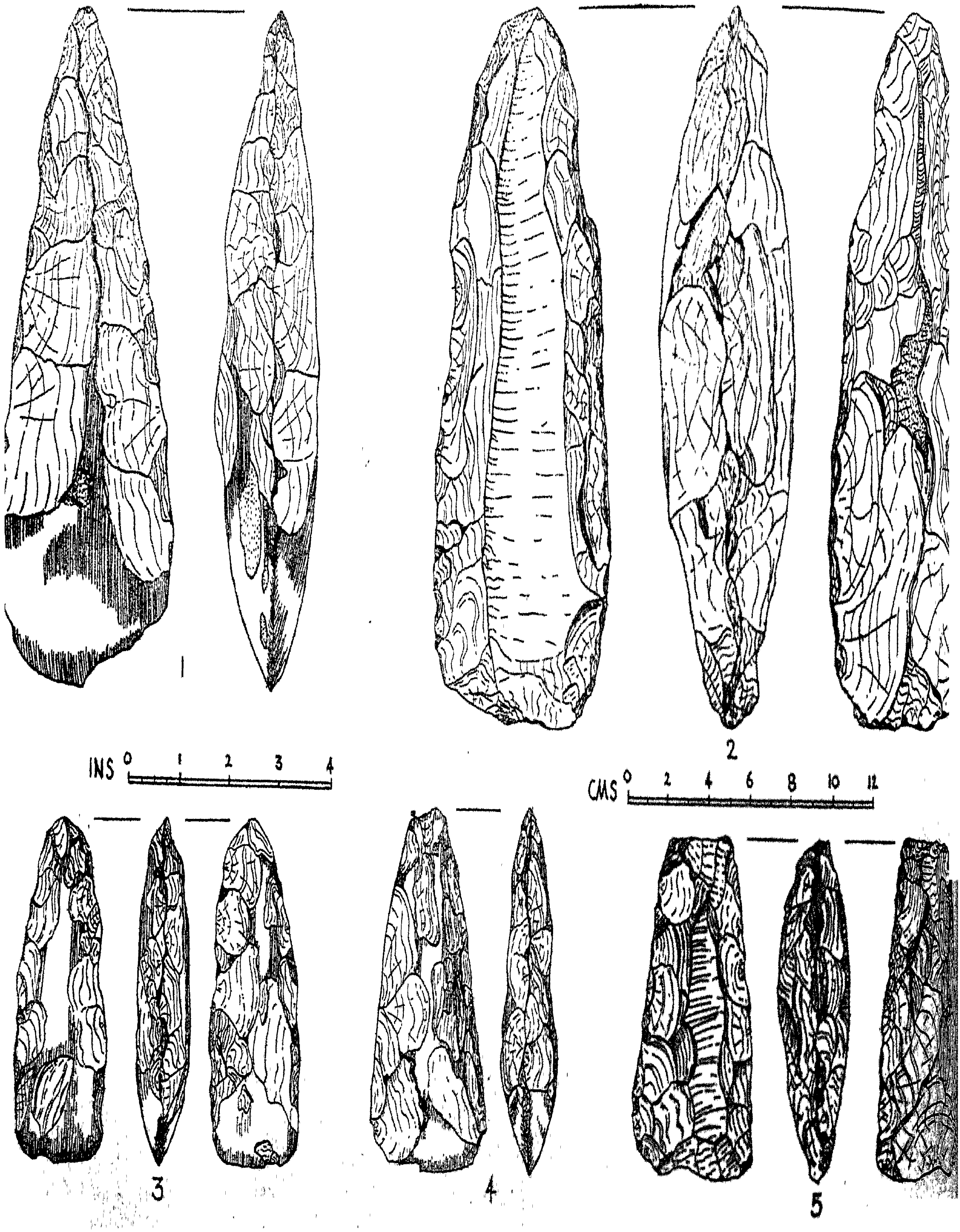
24. A crudely modelled bull of lightly burnt clay, without dressing or burnish (A1), with exaggeratedly large hump and tail, and four short stumpy legs. The head and horns are missing. The tail has been broken but the scar remains where it was originally attached to the body (Pl. 40, 5 and Pl. 41*b*, 5)
Site I, layer 6

25. Part of the body of an animal, incompletely fired, with black body and buff oxidized surface. The animal is unidentifiable .. Site I, layer 2

26–29. Four very crudely modelled legs of incompletely burnt clay, found near the surface of Sites VIIIA and C. Three of the legs are between eight and nine inches in length, the fourth is eleven inches. The legs are about three inches in diameter at the centre but splay out at the base and also slightly at the top. They are hand-modelled and the technique of building them up around a solid core by the addition of layer upon layer of clay can be observed; there is no trace of the original body surface. At least one of the legs betrays evidence of attempted naturalistic modelling, to resemble the leg of an elephant or perhaps a bull. The indications are that they come from some crudely made theriomorphic sarcophagus. In the same layer and vicinity many fragments of similar clay were found, often with coarse straw added to the body before firing as a binding, apparently from the body and walls of such a sarcophagus. However, the whole assembly is quite unlike other examples of theriomorphic sarcophagi and the



A ware terracotta figurines



Ground stone industry : axes

possibility cannot be ruled out that we have here remains of a very large model of a bull (Pl. 42*a*) .. .. Site VIIIA, layer 1

(*b*) *Figurines from the surface collection:*

30. Rough ball of terracotta, ill-fired, buff and black, diameter 1·25 inches, possibly a sling stone or marble .. .. Area B

31. Roughly modelled cylindrical leg of ill-fired terracotta with buff surface. Height 4·5 inches, diameter at base 3 inches .. .. .. Area B

32. Leg of unidentified animal of coarse buff clay, lightly fired .. Area B

33. Hump of bull, detached at joint, of ill-fired black clay with buff body (A1), probably Neolithic. Length 1·25 inches, breadth 1·5 inches .. Area B

34. Part of the horns, hump and body of a bull of lightly fired micaceous clay. The body is grey but the original surface has all flaked away. Probably Neolithic (Pl. 40, 8) .. .. Area B

35. Roughly modelled bird of buff surfaced clay (A1). The eye is indicated by light stick impressions. The tail is missing but the head is turned towards the ground. Possibly a jungle fowl (Pl. 40, 9 and Pl. 41*b*, 3) .. Area B

36. Head of an animal of black earthenware with buff surface (A1). The eyes are roughly indicated with lightly incised lines, the nostrils are indicated by wedge-shaped impressions. Below is the scar of the neck; above a roughly circular scar where horns or ears were attached. The animal could be either a horse or a bull. Taking account of the general form, at first sight it appears more closely to resemble the former, but if the horn scars are admitted the resemblance to a bull seems more definite: probably a bull. If the complete figure had anything like natural proportions, or the proportions of No. 3 above, it might be expected to stand to a height of about one foot. Similarly if the same criteria were applied to the hump, No. 33 above, it might be expected to come from a still larger animal (Pl. 40, 6) .. .. Area B

37. Human torso of grey-black clay with buff well burnt surface showing traces of red dressing, A1–3 ware, should belong to Lower Neolithic; the head is missing and the arms are both broken above the elbows. The figure is apparently male and there is a suggestion that it was ithyphallic: the legs are both broken (Pl. 40, 7 and Pl. 41*b*, 2) .. .. Area A

38. Bird, similarly modelled to No. 35 above, of a black well-fired clay with buff-orange surface (A1). The tail is raised slightly above the level of the head, which is broken. Probably a jungle fowl (Pl. 40, 10) .. .. Area A

39. Fragment of black clay with typical buff (A1) surface, representing the poll of a bull. The scars of the two horns are clearly visible and seem to have been about 1·5 inches in diameter; the breadth of skull between the horns is over two inches: thus, if this interpretation is correct this creature must have been three or four times the size of No. 3 above, i.e. have stood to a height of two feet or even more .. .. Area A

40. Figure of a bull of buff surfaced A1 ware, roughly modelled with the head partly broken, and the hump removed. The scar of the hump and nose are visible. The horns are exaggeratedly large, dominating the whole figure. The underside has a concave surface and appears to have been luted on to some larger body, in a similar manner to No. 19 above (Pl. 40, 4 and Pl. 41*b*, 1)
Near Site VIII

(*c*) *Other objects of terracotta :*

In addition to the various figurines listed above a number of other objects were found which cannot be included either there or under pottery. We shall now list a selection. The majority of these pieces fall into two or perhaps three classes: first, a class of fragments of well-burnt daub apparently from wattle and daub structures of the Upper Neolithic; second, fragments which may belong to the sarcophagus mentioned above; and thirdly, pieces of burnt clay which seem to have been rejected from some medieval industrial activity, probably iron smelting. As many of the two latter classes come from the upper, mixed layers, or from closely contiguous sites, and as at the time of excavation the possibility of dividing them thus had not been recognized, it is probable that without further work the two latter classes may be somewhat confused.

41–47. Fragments of daub, lightly burnt in an oxidizing fire, with impressions of a regular wattle screen on the inner surface only. The wall from which these pieces came, as far as can be discerned, was straight, not curved. The size of the sticks of the screen varies between 0·5 cm. and 1·75 cm. They lie mainly in a single direction but in one or two instances rather larger impressions remain of horizontal sticks. The thickness of the daub varies between two and four centimetres, three being about average. The clay lacks any special binding materials (Pl. 42*b*). Should belong to Upper Neolithic .. Site VII, layer 8

48-49. Two similar pieces of daub, but without the impressions of sticks
Site VII, layer 8

50. A piece of similar daub of very porous burnt clay or cow-dung with traces of burnt out organic matter. It is smooth on one face but has impressions of a wattle screen on the inner face. Appears to be part of a flat panel
Site VI, layer 1

51–54. Four pieces similar to Nos. 41 and 48 above .. Site VII, layer 8

55. Another fragment of similar daub .. .. Site VII, layer 9

56-57. Two large pieces of more massive nature than any of the preceding, one has been neatly smoothed on the outside to form a rounded section at the edge suggestive of a clay door moulding. The clay is of the lighter, more porous kind of No. 50 above and probably includes cow-dung. The exact context of these two pieces is uncertain as they come from the immediate vicinity of pit 3, Site VII. They may thus either belong to pit 3 or to layer 5.

58-59. Two more pieces similar to No. 56 above. One has smoothed outer surface and impressions of wattle on the inside. The smoothed surface is in the form of an arc. Possibly it comes from some grain storage bin with clay lining.

Such bins are today common in the area. The context is similar to that of the two preceding pieces, i.e. Site VII, layer 4, but from immediate vicinity of pit 3.

60. Large piece of ill-fired clay, similar to above but with less organic content and higher refractory. There is no trace of any wattle screen impressions, the outer surface is curved. Perhaps part of a rough legged sarcophagus. Found in same area as Nos. 26–29 above .. .. .. Site VIIIA, layer 1

61. A very large lump of formless clay, roughly burnt, apparently a segment of a large flattened cone of about one foot in diameter, and about four inches in depth. Resembles the terracotta mounting bases for potters' wheels Area of Site VIII

62–63. Two more pieces similar to No. 60 above, one of them has a rounded edge and could well belong to the side of a sarcophagus Site VIIIA, layer 2

64–68. Five pieces of coarse clay with organic admixture, probably cow-dung, lightly burnt, perhaps from some industrial activity. They are neither of the same class as the wattle and daub fragments, nor the sarcophagus fragments. Possibly connected with iron smelting .. .. Site VIIIB, layer 1

69–71. Three pieces similar to above .. .. Site VIIIB, layer 2

72-73. Two pieces similar to above .. .. Site VIIIB, layer 3

COMPARATIVE

There is a paucity of materials for comparison with the Piklihal terracottas. From the excavations at Brahmagiri comes one example from the IB culture which could be a bull. At least the *appliqué* tail resembles closely the technique of some from Piklihal. A second unstratified example from Brahmagiri is even less distinct.[1] The excavations at Sanganakal and Maski produced nothing from the Neolithic levels. The only body of material which may be compared is from surface collections and earlier work at Maski. Even on the strength of the published materials from these it is hard to agree with Mr. Thapar's estimate of their rarity.[2] But if the mass of material formerly stored in the Hyderabad and Maski Museums, and now variously stored in Hyderabad, be taken into account the estimate is seen to be incorrect. Until the Maski material is properly studied and published it is hard to make any definite comment upon it, but something must be said. First there is a large number of specimens belonging to the B ware tradition which may all be assigned to the early historic period. This includes a certain number of moulded terracottas of Sātavāhana types,[3] others with a B1 or 3 red or black surface, many of B4 red or buff ware made in a single mould including certain classical Roman types which cannot be mistaken, certain types which are associated with Parthian prototypes from such sites as Seleucia,[4] and other specimens which even if nondescript may be associated with the early historic period. Along with this group we may notice the wealth of terracotta engraved ear discs, reminiscent of specimens from the Ganges valley sites.[1] When all these specimens have been accounted for there remains at Maski a perplexing number of animals, principally bulls but including also rams, sheep and lions, some of which are almost certainly to be associated with the A1 group from Piklihal. A typical specimen of an A1 bull was long ago discovered by Foote at Maski. The scar of the hump is clear and the tail is represented in just the same way as in the Brahmagiri specimen already mentioned.[2] There are also examples of A3 ware figures from Maski which should date from the Lower Neolithic of Piklihal. In examining a small box of surface finds made many years ago by Munn, I came across a typical head with beaky nose and clear horn scars, but without any trace of hump, in this ware. In the same collection was another typical body of an animal in A1 ware. Thus there seems to be good reason to suppose that further excavation and publication can provide a closely similar range of types at Maski to those found at Piklihal.

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[1] *Ancient India*, No. 4, *loc. cit.*, p. 269.

[2] For example: *A.R.H.A.D.* (1935-6), 36-7.

[3] *Ancient India*, No. 13, *loc. cit.*, p. 110.

[4] van Ingen, W.: *Figurines from Seleucia* (1939).

If there is at least some evidence of local comparative material there is nothing from the region further north which can be properly compared. To the south there are the unique and problematic Nilgiri terracottas which are not altogether unlike our Piklihal types, although the buffalo completely replaces the bull. There are other features however associated with the earliest graves of the Nilgiris which indicate that they belong to a time which is definitely post-Neolithic. It is probable that more extensive work in Maharashtra and Malwa may reveal something to bridge the gap which otherwise lies between our Deccan specimens and those of Sindh and beyond. The terracotta bulls from Nagda are obviously very important in this context, particularly as they are reminiscent in form of some of the earliest rock bruised bulls from Piklihal.[3] A comparison of our terracottas, no less than of all the essential elements of the Piklihal Neolithic culture, with those of the Indus valley can be made. The result is unexpected and confused by the imperfect nature of the earlier research and excavations at the Indus valley sites. Thus, the nearest parallels for our Lower Neolithic bulls are to be found in a series excavated from Area J at Harappa; these have the typical joined front and rear legs, a high angular hump and long horns.[4] If we apply Mackay's rule the joined legs should indicate their earliness. No very close comparisons can be made with the bulls of Mohenjo Daro, but from Chanhu Daro comes another series made in much the same way and burnished over a thick red slip.[5] There are, however, in all the excavated Indus sites many humped bulls which bear little specific resemblance to those of Piklihal. If the principle of the divided legs being later than the joined has any validity it may be said to relate to the Deccan sequence also. Beyond the Indus many Chalcolithic sites have produced humped bull figurines. Those of Kulli and Mehi are mainly heavier than their Deccan counterparts, but are the closest we can find in this area. In the sites of Iran, Hissar, Shah Tepe and Sialk bovine figurines are largely wanting, or if they occur it is without the distinctive hump of the *bos indicus*. It is also easy to find close correspondences for the bird figurines of Piklihal in the Indus valley sites, but the resemblances are of so general a nature as to make the comparison of little value. However the specimens from Chanhu Daro and Harappa so closely resemble our Piklihal bulls as to constitute identities and as they relate to the Lower Neolithic may be taken as giving some evidence of culture contact during the period when the Indus valley cities were flourishing.

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[1] *A.R.H.A.D.* (1936-7).

[2] Foote, R. B.: *I.P.P.A.* Catalogue Raisonné (1914), Nos. 2783-87.

[3] *Indian Archaeology* (1955-6).

[4] Vats, M. S.: *Excavations at Harappa*, Pl. LXXIX, 61-3, from Area J, stratum V.

[5] Mackay, E. H. J.: *Chanhu Daro Excavations, 1935-6*, pp. 155-7 and Pl. LV, Nos. 9-12.

3. GROUND AND PECKED STONE INDUSTRY

The following analysis is based upon three classes of material: about fifty objects found during excavation, a surface collection of over two hundred and fifty pieces and a small number of larger, heavy, pieces noted on the surface but not collected. Typological and technological analysis of these reveals that the industry is in almost all respects similar to that of Bellary which I have described fully elsewhere.[1] I shall follow a system similar to that used in the study of the pottery, first considering the technological aspects of the industry, then the functional and finally listing the excavated specimens.

TECHNOLOGY

The rocks used as raw material at Piklihal follow much the same lines as those employed at Bellary. They are all igneous or metamorphic: the former ranging from varieties of granite, syenite, and diorite, to dolerite and basalt; the latter from quartz and quartzite to varieties of schist and gneiss. The choice of rock no doubt depended upon the utility and thus related to the physical properties of the rock and its workability. The finer grained rocks were favoured for making edge tools, the coarser for rubbers, grinders, hammers, etc. Thus of the axes which form over half of the total collection, basalt is by far the commonest rock; while for hammers, rubbers and grinders, granites, quartzes, diorites or dolerites are more common. It is noteworthy that many tools of similar types in Bellary and Raichur are made of the same raw material. The most striking example of this is that recorded by Foote, that spheroid rubbers (he calls them corn-crushers) occur at fourteen sites in Bellary and Anantapur districts made of the by no means ubiquitous rock pistacite. In our collections at Piklihal nearly half of the spheroid rubbers found are of the same rock. No other tool types of pistacite occur, either at Piklihal, Bellary, or elsewhere in Foote's collections.

The manufacturing techniques of the tools are also identical to those of Bellary. From this may be inferred not only the general contemporaneity of the industries but also the close contacts they enjoyed, perhaps amounting even to trade contacts. Three basic techniques were employed—flaking, pecking and grinding. It is possible to discern, further, five separate processes of manufacture of axes; these occur in varying combinations. Many tools show evidence of prolonged use although the more refined, and probably costly processes, at least in labour value if not in exchange, are absent. The five processes are: rough flaking (primary) to block out the tool (Pl. 45, No. 7); fine (secondary) flaking to regularize the form and to sharpen the edge (Pl. 44, No. 9); pecking or hammer dressing (Pl. 44, Nos. 5 and 7); edge grinding (Pl. 44, Nos. 1 and 10); and overall grinding (Pl. 46, No. 5). It seems fairly certain that some of the tools found were actually employed in these processes. Thus the first was probably done with suitably sized spheroid or discoid hand-hammers, the second with smaller cylindrical hand-hammers and perhaps fabricators, the third with similar fabricators, etc. Grinding was carried out in specially prepared grooves in the rock. No such grooves were found at Piklihal but at various sites they have been observed. Recently while visiting Sanganakal with Dr. Subbarao we discovered there a beautiful portable grinding stone of this type. Many unfinished tools were abandoned, perhaps because of some flaw in the rock. Others were roughed out and then used as hammers only; others again were finely flaked and then never ground, even though used; many were broken during use and then roughly reflaked so as to permit their use as (?) wedges or as axe-hammers. Pecking was rarely employed on axes except those of green diorite. It was more common for rubbers and grinders, querns, etc. Likewise overall grinding was a rare process reserved for a small number of small well finished tools.

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[1] cf. my paper 'The ground stone industry of the North Karnataka region' in *B.S.O.A.S.*, XIX/2 (1957).

In discussing the Bellary collections, of which a large percentage were complete tools, or nearly so, it was possible to pay attention to the relative frequency of the application of the various techniques and, for example, to the occurrences of axes of differing sizes.[1] In the present assemblage fragments as well as complete tools were collected and thus it becomes difficult to study these aspects. However, there is at Piklihal new evidence from the excavations which puts the purely typological analysis of the Bellary surface collections on firmer ground. We shall consider this below. Also we shall utilize the evidence of the surface collections to produce a new picture of the functional behaviour of the tools. Before doing so, we may conclude this survey by remarking that at Piklihal, no less than at Bellary, examples of all the main types occur, and that in the axe group the varieties are represented in about the same proportions as at Bellary. Thus the majority of the axes belong to what we there called the Bellary axe type, and what we may now call the Central Deccan or North Karnataka axe type.

FUNCTIONAL

The following table lists the numbers of tool types found in the surface collections, it includes both whole tools and recognizable fragments of tools. The tool types are largely the same as those given in my earlier paper and I do not propose here to repeat the justification of some of the functional terms used. It has been found necessary to add one or two minor types which did not occur at Bellary, but otherwise they may be compared type by type with those of my classification or those illustrated by Subbarao in his pioneer study.[2]

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[1] cf. my paper 'The ground stone industry of the North Karnataka region' in *B.S.O.A.S.*, XIX/2 (1957), tables II and III.

[2] *Stone Age Cultures of Bellary* (1948).

Table 1

CLASSIFICATION OF PIKLIHAL SURFACE COLLECTIONS

Tool Types	*Number in Collection*	*Notes*
Edge Tools :		
Axe group (all varieties)	132	Mainly of basalt, odd specimens of granite, dolerite, diorite. Several are heavily patinated.
Adzes	1	True adze blades are very rare at both Bellary and Piklihal.
Chopping tools	—	(*See* Allchin, *loc. cit.*, 1957, p. 332.)
Discoids	1	Probably a reworked axe.
Chisels	8	All of basalt.
Wedges	(16)	These all seem to be broken axes, reused. They are listed also under axes.
Scrapers and by-product flakes	29	All of basalt.
Points :		
Picks	2	
Borers or pointed fabricators	2	All of basalt.
Rubbers and Grinders :		
Spheroid rubbers (Foote: corn-crushers)	24	Eleven of pistacite, others of granite, diorite, dolerite.
Oval rubbers (? also used as anvils)	9	Of granite, gneiss, and one of crystalline quartz.
Querns	2	Of granite. About eighteen other specimens were noted but not collected.
Flat grinding stones, palettes	7	Of granite and gneiss.
Other	2	Perhaps fragments of palettes.
Hammers :		
Spheroid and discoid hand-hammers	15	Of basalt, dolerite, granite, one heavily patinated.
Cylindrical hand-hammers	6	
Axe-hammers	7	Three were probably broken axes, reused.
Cylindrical pestles	1	Highly polished granite.
Pestles or potters' dabbers	1	(?) polished syenite.
Grooved hammers	—	One very large specimen of granite was observed but not collected.
Miscellaneous :		
Bored mace heads (Foote)	—	
Stone discs, balls, etc.	—	
Other selected stones	8	
Total	257	

(*a*) *Description of types, based mainly upon surface finds*

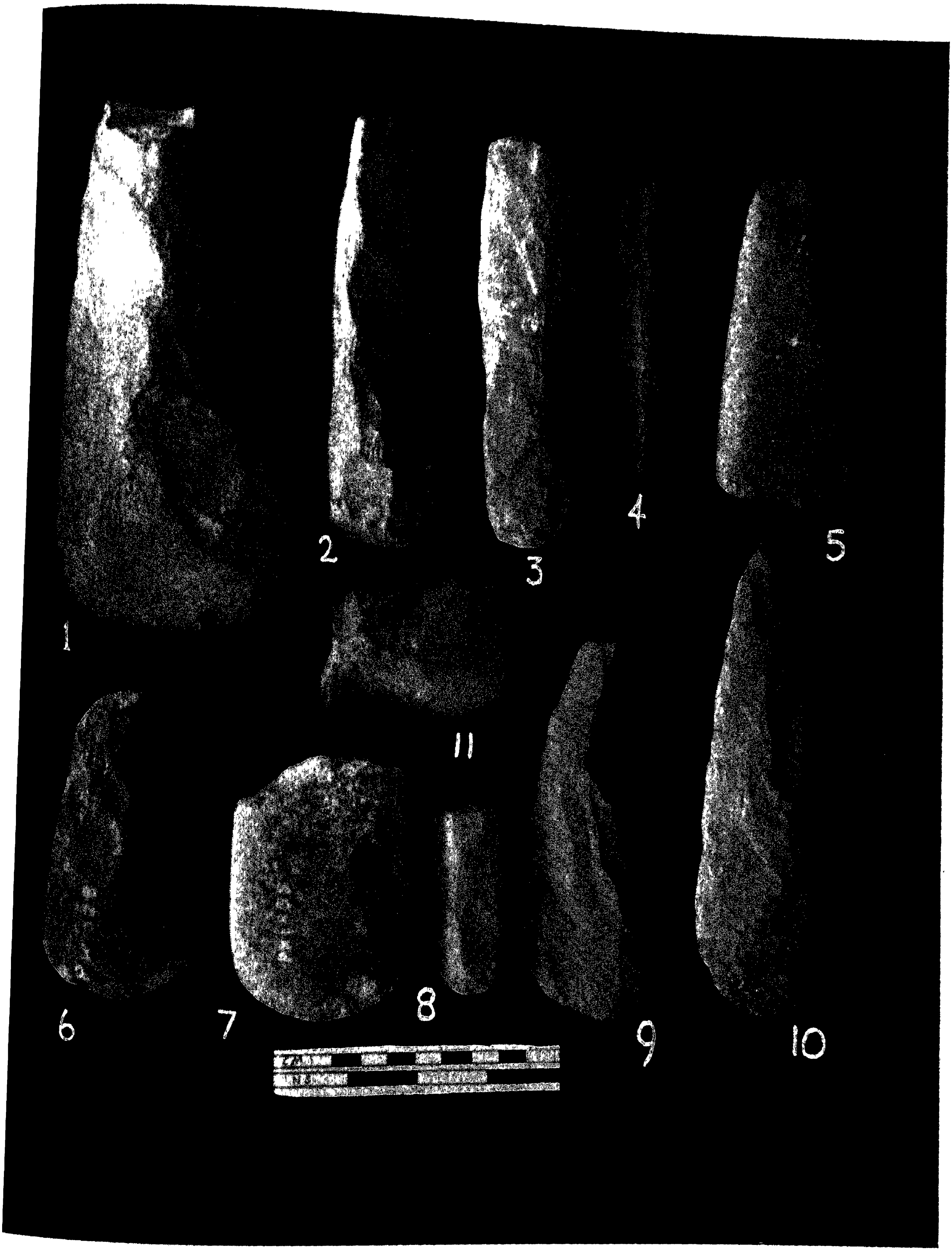
EDGE TOOLS

Axe group.—It appears that from any sufficiently large assemblage of tools certain regularly recurring varieties emerge. It is pertinent to note that neither at Piklihal nor Brahmagiri were the numbers of tools found in the excavations sufficient to demonstrate the variant axe types, although some specimens do occur at both sites. The variants which I described at Bellary, as occurring alongside the Bellary axe type, were: first, edge ground and pecked all over, a shapely variety, probably also costly, made almost invariably of green diorite, but sometimes of grey diorite or dolerite (Pl. 45, No. 6, Pl. 44, Nos. 5 and 6, and Pl. 46, No. 13, are examples); second, ground all over, mainly small well-shaped tools of basalt which were probably hafted and used adze-wise, even though technically speaking their blades were axe blades (Pl. 46, Nos. 5 and 10); thirdly, flat tools, made from expressly tabular material, also mainly small, and probably less valuable than, though of similar function to, the second variety, this type was very rare at Piklihal and no specimens are illustrated; fourth broken axes which had been reworked and reused as wedges or axe-hammers (no good example is illustrated). Alongside these variants occurred the dominant axe type, ranging from small to large, with usually pointed butt but sometimes squared, and with edge sometimes convex, sometimes straight. The section varies from oval to circular, and from flattened oval to lenticular. The edge is essentially bifacially treated, even in specimens which appear to have been used as adzes (Pl. 43, Nos. 1, 3–5, Pl. 44, Nos. 1, 9 and 10).

From the point of view of use we find that out of more than one hundred specimens only about one in ten is anywhere near complete. The great majority of the remainder are fragments. They show that the most common result of use was that the edge became steadily more and more blunt as small flakes were removed from it by impact. There is no clear evidence for or against regrinding: some axes certainly continued to be used when they had become very blunt. When the axe became too blunt it was sometimes roughly reflaked along the edge and probably reused as a wedge for wood splitting; or it might, if better suited, be further flattened at the end and reused as an axe-hammer (Pl. 44, No. 6) A more serious accident, which can be presumed to have resulted from a false stroke, is the flaking away of the entire edge-end of the axe (e.g. Pl. 45, No. 1). Sometimes this left a deep scar so that the direction of the blow can still be detected. A second type of breakage is the cleaving of the butt from the body, probably near the edge of the haft. Sometimes both edge and butt have been struck off. A final breakage, evidenced by fragments from the surface collections and fully verified in the excavation, is of shattering by fire (Pl. 49*a*).

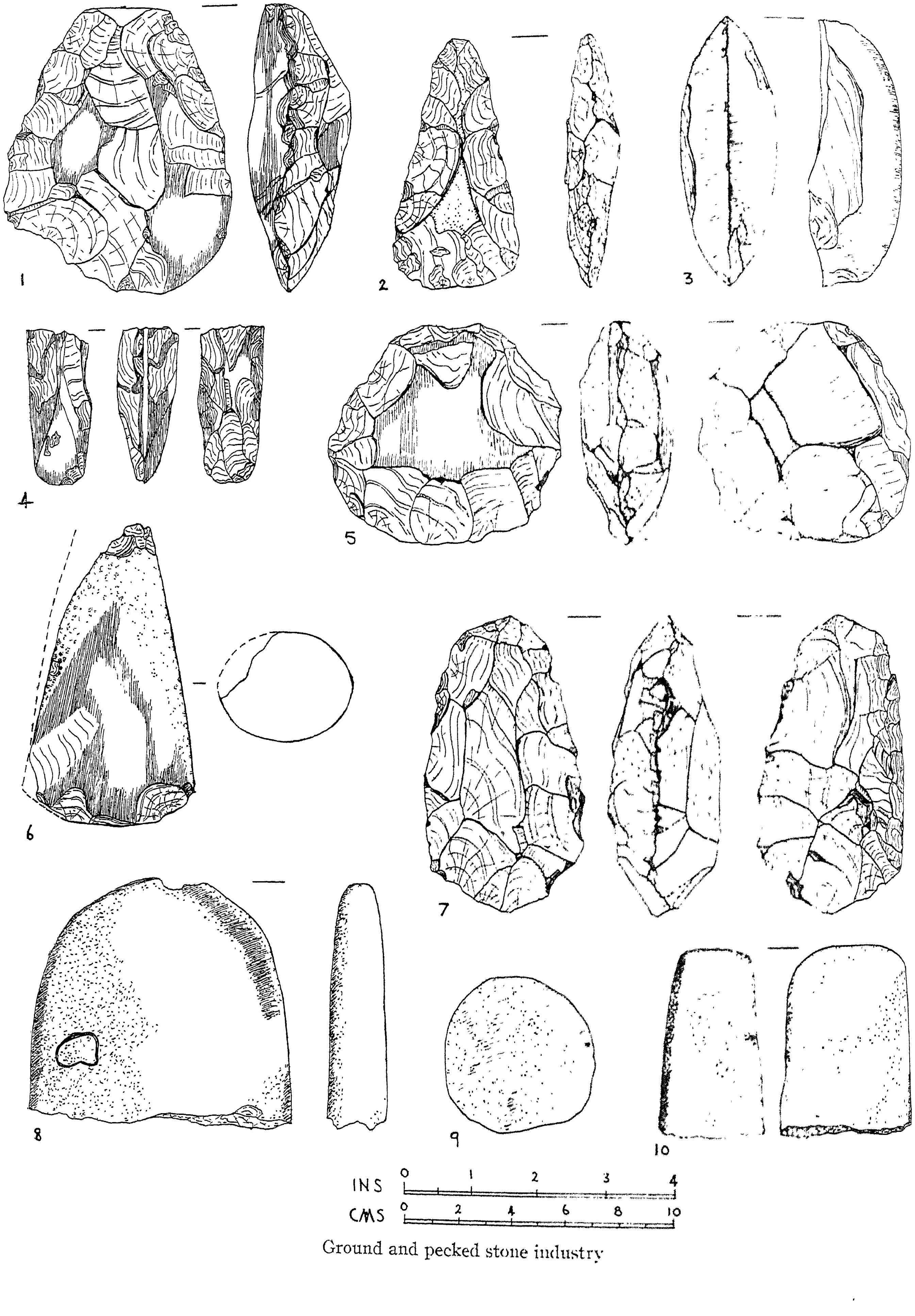
We may summarize the evidence of functional behaviour for the Piklihal surface collection axes thus:

PLATE 44



Ground stone industry: axes, etc.

PLATE 45



Ground and pecked stone industry

Table 2

Rough blocks	14
Complete axes	16
Axes with edge broken, not reused	26
,, ,, ,, ,, reused as wedges or axe-hammers	16
Ground edge, body missing	24
Butt only, body missing	25
Body without edge or butt	11

Adze.—A single example of a blade so unevenly ground as to be classifiable as an adze blade occurred. This is a small broken tool of dolerite, which has been roughly flaked to a rectanguloid section and ground, steeply on the upper surface and less steeply on the lower (Pl. 44, No. 11).

Discoid.—A single discoid of basalt occurs, it is apparently made upon a broken axe. Part of the upper face is ground to a polish, flakes have been taken off on both sides all around (Pl. 45, No. 5).

Chisels.—Eight specimens occur in the surface collections. The most regular are of the type of Pl. 45, No. 4, and Pl. 46, No. 8, with neatly flaked squarish sections and carefully ground bifacial edges. All are of basalt. Another example has a heavily used and blunted edge (Pl. 44, No. 8). Pl. 46, No. 6, is a heavily used body with blade broken off but with heavy wear marks on the body, a gloss suggests hafting wear on the ridges of the flake scars.

Wedges.—We have already described these tools as mainly reused broken axes. The most common method of use was to take off a series of deep flakes from one side of the broken edge, a less common variety has been hammered down to make a blunt edge. This type is not easy to distinguish from the axe-hammer. Sixteen specimens in the collections.

Scrapers and by-product flakes.—There are twenty-nine examples in the collections, all of basalt. Nine are illustrated in Pl. 50. Several appear to be flakes which have been struck from axes, probably during use, and then reutilized; others to be flakes struck off blocks during the process of manufacturing axes. Pl. 50, No. 1, is a long blade flake, which resembles the long flake struck from the axe shown in Pl. 43, No. 2. Nearly all the flakes show some evidence of use, but this was probably more casual or chance use than regular, and the specimens would seem therefore to be by-products rather than specific tools.

POINTS

Picks.—Two basalt specimens may be classed as picks, if the definition used in my earlier paper be accepted. I there distinguished the picks from the borers by their bearing evidence of hafting, and by their slightly larger size. The two specimens are illustrated in Pl. 44, Nos. 2 and 3. Both are of basalt, flaked to a roughly square section. Both bear traces of heavy wear upon the body and would thus seem to have been hafted. Neither is complete, with the ground and pointed end figured in examples from Bellary.[1]

Borers or pointed fabricators.—This type was distinguished at Bellary by its absence of body hafting marks and slightly smaller size than the pick. No typical specimens are found at Piklihal. Pl. 44, No. 4, is an example which was classed as a borer, it is a thin dolerite point, flaked and slightly pecked, with a triangular section.

RUBBERS AND GRINDERS

The division of this group and the succeeding one, hammers, is obviously vague. I have here too followed my treatment of the Bellary groups, making the division on the basis of use marks as indications of the primary function of any given tool. However, it must be remembered that many of the tools in the two groups could have been used for more than one function and thus could appear in both.

Spheroid rubbers.—There are no less than twenty-four in the surface collections. As already noticed nearly half were of pistacite. It is probable that they were employed for a variety of domestic uses, mainly as crushers and rubbers or pounders, but possibly also as hammers. They were made from roughly squared blocks of stone, pecked until they assumed a sufficient rotundity. In Pl. 48, Nos. 2, 3, 4 and 7 are of pistacite, Nos. 1 and 3 of diorite, No. 6 of dolerite, and Nos. 8 and 9 of granite.

Oval rubbers.—There are nine examples in the surface collections. These rubbers, which may also have been used as anvils in stone working, fit well into the distinctive querns and were no doubt used with them in regular practice. In the excavations a specimen was actually found *in situ* in a quern. In Pl. 47*a*, No. 1 is an almost complete specimen of dark syenite, flattened on the under side, No. 2 is of quartz, broken, and flattened also on one side, and No. 6 is also a broken specimen of dolerite, flattened on the lower face and arched on the upper. All appear to have undergone prolonged use.

Querns.—These were usually made of granite. On account of their weight only two were included in the surface collection but eighteen more were noticed on the site. These all conform more or less to a single type which is well illustrated by Pl. 49*b*. A roughly oblong block of granite was selected and the upper face was slightly hollowed out, no doubt the hollow became deeper with repeated use and in some cases the block had been turned over and the flatter under side also used. In some cases they had been absolutely worked out in this way and the centre had become so thin that it had broken. It is not, however, clear whether the neat round hole in the base of the illustrated example is the result of such use or whether it is a purposeful addition to the quern. If so its use is obscure. We may recall the beautiful rectangular example found during the excavation of Site VII and shown in Pl. 17*b*. Incidentally querns of this distinctive type are still made in the region, and Thurston follows the gazetteer in

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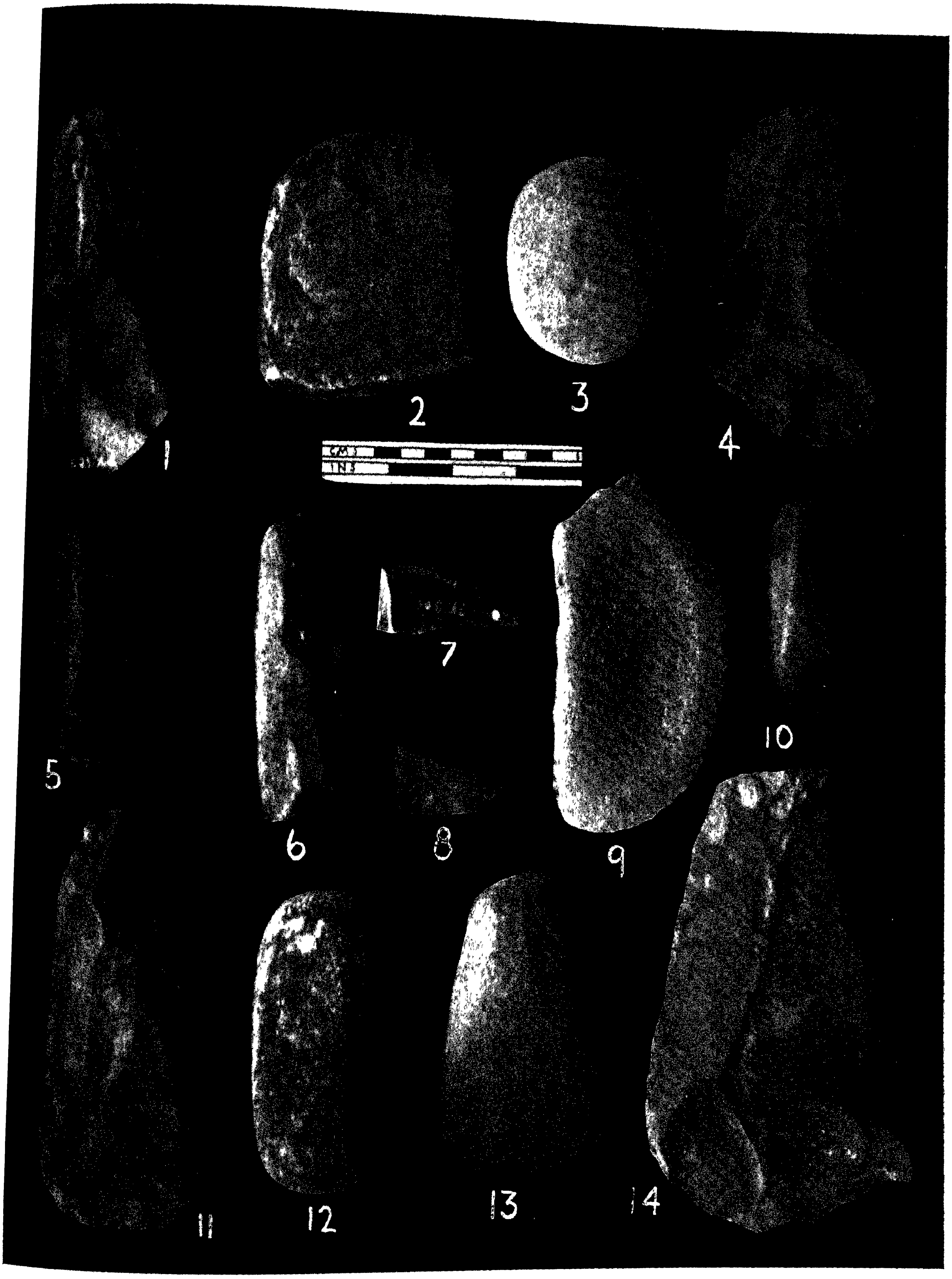
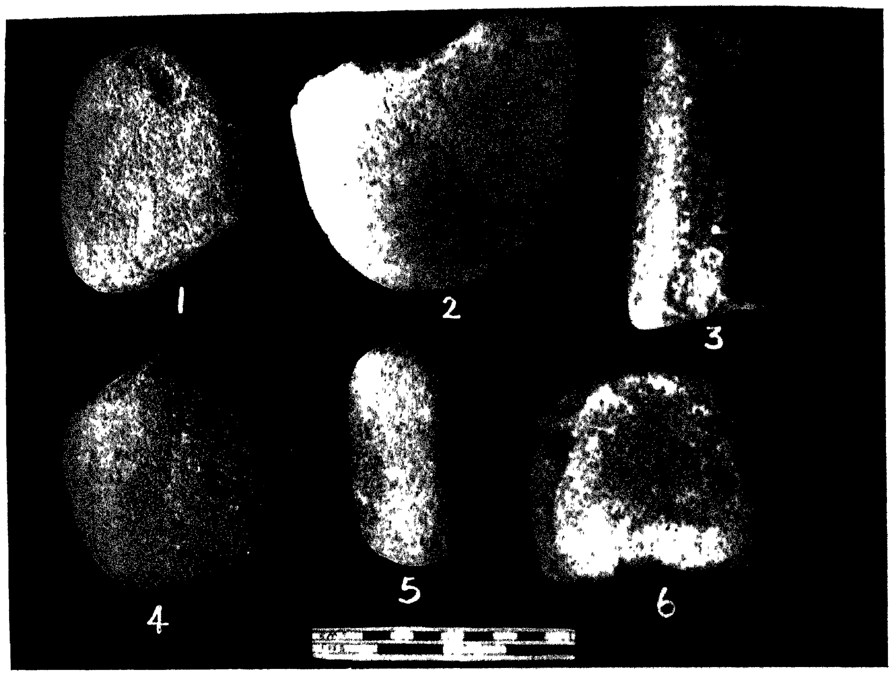
[1] Subbarao, *loc. cit.*, Pl. XXIII, Nos. 7–10.

PLATE 46

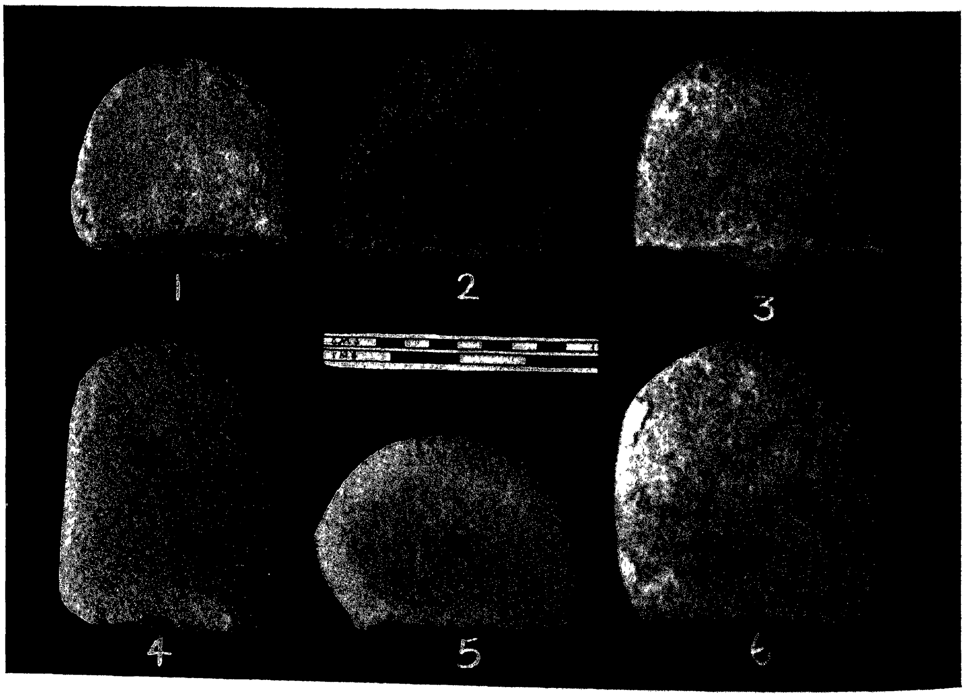


Ground and pecked stone industry

PLATE 47



(*a*) Ground and pecked stone industry : rubbers and grinders



(*b*) Ground and pecked stone industry : rubbers and grinders remarking upon the unusual oval grind-stones with flat base and hollowed upper surface into which an upper stone fits.[1]

Palettes.—These are flat grinding stones, well made and carefully flattened on both faces, usually of little more than an inch or an inch and a half in thickness. They were probably used for grinding powders, etc. Six broken specimens are illustrated in Pl. 47*b*, and another one in Pl. 45, No. 8. Nos. 1 and 3 are of a pale grey quartzite, and No. 6 of a pinkish quartzite. The remaining three are of granite. The last specimen is of buff quartzite.

Other rubbers.—There remain a few rubbers of other forms. Pl. 45, No. 10, is a broken rectangular sectioned, rectangular formed, rubber of granite. Pl. 47*a*, No. 4, is a discoidal rubber, perhaps a broken oval which has been pecked to its present form.

HAMMERS

Spheroid and discoid hand-hammers.—Fifteen tools in the collections can be classed under this heading. They are most frequently of basalt and, as already noted, many seem to have been used in the manufacture of axes. None is illustrated.

Cylindrical hand-hammers.—Of the six specimens, which are also most commonly of basalt, one is illustrated of red syenite (Pl. 46, No. 12), and another (Pl. 47*a*, No. 5) is of green diorite.

Axe-hammers.—The reuse of axes whose blades break for the making of hammers, perhaps for hafting axe-wise, perhaps for use as pestles, has already been mentioned. One specimen is illustrated (Pl. 44, No. 6), it is made of basalt. Others are made of diorite.

Cylindrical pestles.—A single specimen of a broken cylindrical pestle of highly polished granite occurred (Pl. 47*a*, No. 3).

Pestle.—Pl. 56*a*, No. 2, and Pl. 55, No. 2, are illustrations of a unique object of a polished brownish-red stone, uncertainly identified as chert. It resembles a potter's dabber, but perhaps was used for some special purpose. It seems unlikely that it dates from the Neolithic period.

Grooved hammers.—A single very large grooved stone was noted on the site but not collected. It may well have been used for tethering an animal, or perhaps for some sort of heavy duty quarry hammer, suspended from a rope held between two men.

(*b*) *Specimens from excavations*

Thus far we have considered the typology and function of the assemblage from the surface collections. This was necessary in order to have sufficient numbers to get reasonable comparative material. Now that we have shown the close relationship of types to the Bellary industry we shall consider their stratigraphical occurrence at Piklihal. Once again we must recall the warning given earlier that the upper layers and surface of the site contain much derived material and thus, in view of the great durability of stone artifacts, they cannot be taken as evidence of continued manufacture or use of stone axes, etc., into the early historic period.

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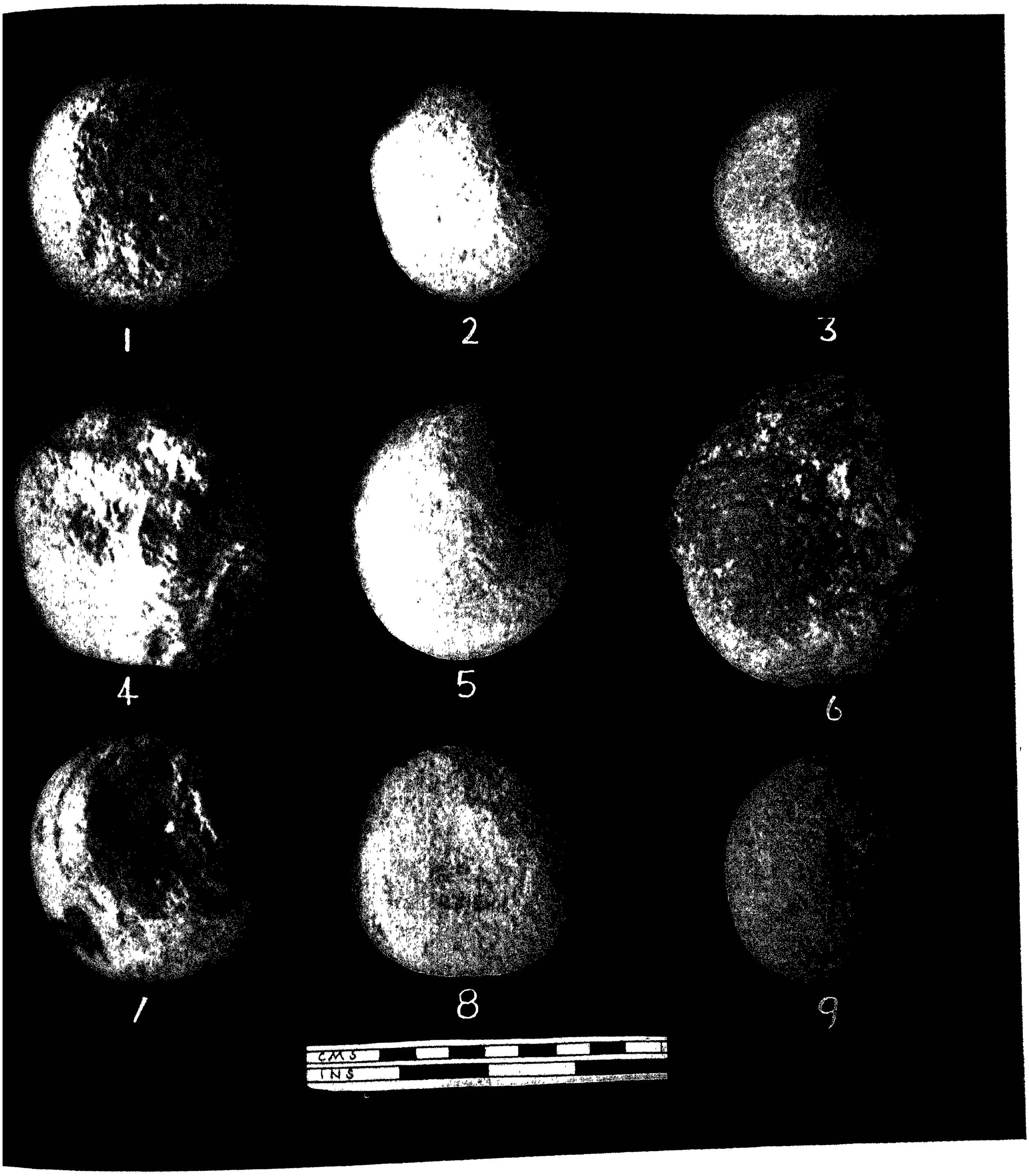
[1] Thurston, E.: *Castes and Tribes of Southern India*, Vol. III; 'Kallukatti'.

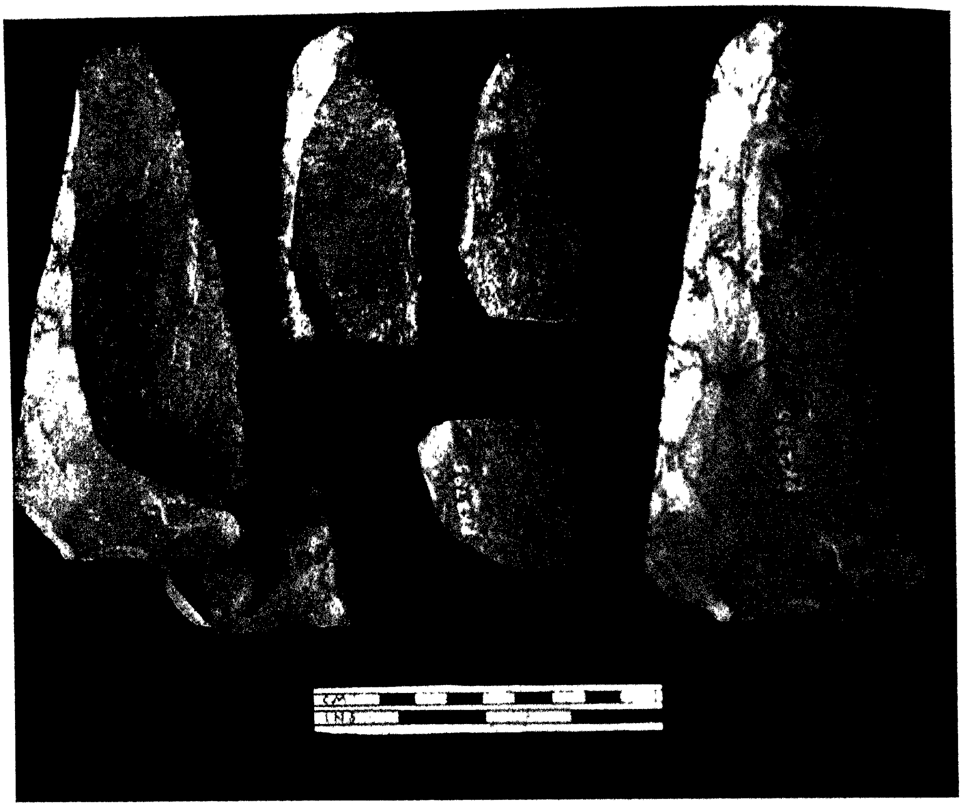
Axe group.—Twenty-nine specimens were found in the excavations. Of these nine may be assigned to the Lower Neolithic, seven to the Upper Neolithic, and thirteen to the later levels. There is no evidence of any typological evolution.

1.	Body of basalt axe with blade and butt broken	Site	V	layer	1
2.	Butt of small basalt axe	,,	V	,,	2
3.	Blade of large axe of basalt, very finely ground and in almost unused condition. The whole edge has broken off the body leaving a deep flake scar. Width 4 in.	,,	VI	,,	1
4.	Part of basalt axe, ground edge and body flaked. The body has been split longitudinally, probably by sudden contact with fire	,,	VI	,,	1
5.	Part of blade of ground stone axe, basalt	,,	VI	,,	3
6.	Body of axe of basalt, flaked and ground, blade broken	,,	VI	,,	3
7.	Butt of basalt axe, small, ground all over	,,	VII	,,	10
8.	Small axe of basalt, edge ground, very heavily worn and clear marks of hafting on body, length 4 in.	,,	VII	,,	10
9.	Part of stone axe of dolerite, pecked all over body, broken blade: with heavy use marks (Pl. 44, No. 7)	,,	VII	,,	1
10.	Broad axe of basalt, with flat square butt, length 5·5 in., breadth of blade 4 in. The edge shows heavy use marks and the body clear signs of hafting	,,	VII	,,	1
11.	Broken blade of thin axe of basalt, has been reused as a rubber (Pl. 44, No. 6)	,,	VII	,,	4
12.	Broken butt of basalt axe	,,	VII	,,	6
13.	Part of body of large, broken axe of basalt	,,	VII	,,	7
14.	Basalt axe, edge broken but with heavy use marks. Body bears sheen from repeated hafting (length 4 in.)	,,	VII	,,	9
15.	Roughly flaked toy axe of basalt, length 2·5 in.	,,	VII	,,	9
16.	Broken edge of ground basalt axe with heavy use marks	,,	VII	,,	2
17.	Part of butt of basalt axe, broken	,,	VII	,,	4
18.	Four fragments of basalt axe found in hearth. The complete axe is 6 in. long, flaked, with ground edge and some use marks (*see* p. 22 and Pl. 49*a*)	,,	VII	,,	6
19.	Ground fragment of basalt, apparently broken from an axe	,,	VII	,,	8
20.	Basalt axe, edge ground	,,	VII	,,	10
21.	Broken butt of axe of basalt	,,	VII	,,	11
22.	Small thick axe of basalt, roughly ground all over, much worn and battered at butt and edge blunted. Has perhaps been used as wedge (length 3·25 in., width 2·125 in.)	,,	VIIIA	,,	1
23.	Ground edge of basalt axe	,,	VIIIA	,,	1
24.	Basalt axe with heavy use marks, ground edge (length 5 in.)	,,	VIIIA	,,	4
25.	Freak axe of basalt with cortex remaining on two faces and no grinding	,,	VIIIA	,,	4
26.	Small basalt axe with traces of use. The edge has been ground and completely blunted, the body bears traces of repeated hafting. From burial (Pl. 23)	,,	VIIIA	,,	4

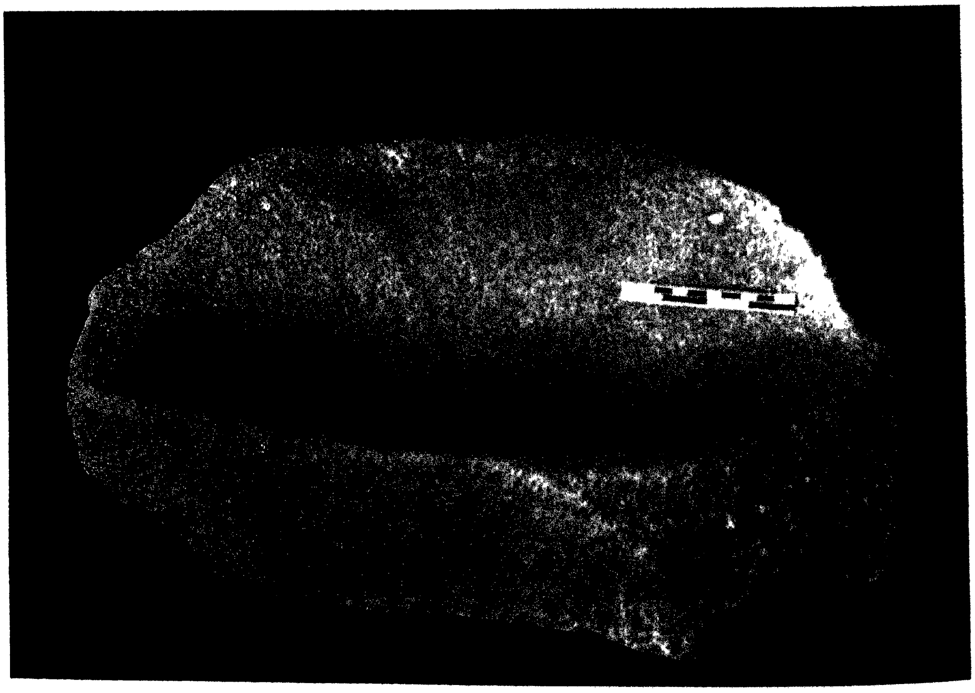
PLATE 48



Ground and pecked stone industry: spheroid rubbers



(*a*) Fractured axe from hearth in Site VII



(*b*) Granite concave quern

27. Roughly flaked basalt axe with ground edge, blunted by repeated use. Length 3·5 in. From burial (Pl. 23) ..	Site VIIIA	layer 4
28. Fragment of basalt ground on one face, apparently from broken axe	,, VIIIB	,, 2
29. Small axe of basalt, roughly flaked and ground, in good condition, blade unusually sharp, but part broken	,, IX	,, 3

Chisel.—A single example of a broken fore-part of a chisel of basalt came from an Upper Neolithic level of Site VII, layer 6. The tool had a highly rectangular section reminiscent of a metal prototype.

Wedge.—We have noticed above the probable reuse of one axe as a wedge (VIIIA, layer 1, No. 22 above).

By-product flakes.—No flakes which could be said to have resulted from the manufacture of tools were found in the excavations. A certain number of flakes, mainly from broken axes, have already been noticed. We may now list several more examples.

1. Flake of basalt	Site I	layer 7
2. Heavily patinated flake of basalt	,, VI	,, 3
3. Blade flake of granite, length 4 in., width 1·75 in. ..	,, VII	,, 10
4. Four fragments of roughly fractured basalt. One with trace of grinding on one face	,, VII	,, 0
5. Two fragments of basalt	,, VII	,, 7

Spheroid rubbers.—Five specimens come from the excavations, but none can certainly be assigned to the Lower Neolithic. On the other hand three belong to the Upper Neolithic. Two are of pistacite, two of granite and one of dolerite.

1.	Spheroid rubber of	dolerite ..		.. Site VI	layer 4
2.	,, ,,	grey granite, diameter	2·5 in.	.. ,, VII	,, 6
3.	,, ,,	grey granite ,,	2·5 in.	.. ,, VIIIA	,, 1
4.	,, ,,	pistacite ,,	2 in.	.. ,, VIIIA	,, 3
5.	,, ,,	pistacite ,,	2·25 in.	.. ,, VIIIB	unstratified

Oval rubbers.—Only two ovoid rubbers were found in the excavations. They came from layers dating from the end of the Neolithic period. Both were found actually lying inside a quern or near a large piece of broken quern, and had probably been used up to the time of burying. Made of grey granite, they come from Site VII, layer 6, and Site VI, layer 3.

Querns.—Only five examples of querns were found in the excavations. All were of granite, and four come from late layers of the Upper Neolithic.

1. Broken quern of grey granite	Site I	layer 3
2. ,, ,, ,, ,, ,, found with oval rubber in it ..	,, VI	,, 3
3. Rectangular quern of grey granite (*see* p. 21), length 21 in., breadth 14 in., depth 7-8 in. (Pl. 17*b*)	,, VII	,, 7
4. Broken quern of grey granite	,, VII	,, 5
5. Broken quern of grey granite, the piece was sufficiently large, evidently, to have been re-shaped and used, as it was found with an oval rubber *in situ*	,, VII	,, 6

Flat grinding stones, palettes.—Two broken fragments of these objects were found, one is from an Upper Neolithic level, and is of dolerite; I have not noted the material of the other. The positions are Site VII, layers 1 and 8. (*See* Pl. 46, No. 2, for the former).

Spheroid and discoid hand-hammers.—A single example of a discoid hand-hammer occurred in Site VI, layer 4; it is of basalt, about 2·5 in. in diameter.

Cylindrical hand-hammers.—A single example of a cylindrical hand-hammer of red syenite, ground smooth all over, occurred in Site VI, layer 2. Length 3 in. (*See* Pl. 46, No. 12).

Axe-hammers.—A single example of an axe-hammer occurred in Site VI, layer 1. It was of basalt, roughly ground, and probably a broken and reused axe.

COMPARATIVE

We shall now list (table 3), for comparative purposes, the numbers of tools occurring at Piklihal in the surface collections and excavations and in the Bellary collections studied in my previous paper.

Once again these figures show a surprising correspondence. The chief difference is in the large number of querns at Piklihal. However, when it is seen that this number is actually those noted on the site, and that the collection only included two examples the comparison becomes closer. Perhaps a more significant variation is in the small numbers of fabricators and hammers at Piklihal. This probably arises from the fact that Bellary was a very large factory site while there is little evidence for the manufacture of tools at Piklihal. The correspondingly larger numbers of rubbers and domestic stones at Piklihal is to be accounted for by the nature of the site and its essentially occupation deposits.

The ground and pecked stone industry of Piklihal and Bellary seems thus to be fairly well established. What of its external relationships? There are obvious correspondences with the stone industries revealed by surface collections in the Shevaroy hills and the Andhra coast, and less closely with those of Central India. Its antecedents outside the peninsula are obscure. The most eligible industry so far reported from Iran is that of Sialk I and II, where markedly tabular axes are common. However, this industry at Sialk had already disappeared in strata III and IV. Thus it disappears at a date which should belong to the IVth millennium. At Hissar the ground and pecked stone industry continued

Table 3

		Bellary Collections (English Museums)	Piklihal	
			Surface	Excavations
Edge Tools	Axe group	164	132	29
	Adzes	—	1	—
	Chopping tools	2	—	—
	Discoids	—	1	—
	Chisels	10	8	1
	Wedges	6	(16)	(1)
	By-product flakes	12	29	5
Points	Picks	—	2	—
	Borers (fabricators)	12	2	—
Rubbers and Grinders	Spheroid rubbers	12	24	5
	Oval rubbers	6	9	2
	Querns	—	20*	5
	Flat grinding stones	3	7	2
	Other ,, ,,	—	2	—
Hammers	Spheroid and discoid hand-hammers	25	15	1
	Cylindrical hand-hammers	8	6	1
	Axe-hammers	21	7	1
	Cylindrical pestles	—	2	—
	Grooved hammers	—	1*	—
	Total	281	268	52

* Includes numbers noted on site but not collected.

to flourish right into Period III, when it was already largely displaced by a plentiful supply of copper. At Shah Tepe the industry was not at all well represented. In spite of odd finds in Sind and Baluchistan there is to this time no very good evidence of such an industry, in those areas. Thus although at Hissar the industry was still in evidence at a date which could well coincide with the earlier phases of the Deccan Neolithic, there is a wide interval of space separating the two, and the origin of the Deccan industry must remain rather mysterious.

4. NEOLITHIC BLADE INDUSTRY

All over the site, throughout every excavated area as well as on the surface, blades, flakes and cores were found in large numbers. The industrial tradition which produced them is distinct from the ground stone industry in respect of raw material, flaking technique and size of finished tools. Over thirteen hundred specimens were obtained from the excavations alone, while a surface collection yielded more than seven hundred. The present study is based upon the excavated specimens and one half of the surface collection. The industry may be compared in almost every way with that of Neolithic and Chalcolithic settlements throughout the East and thus we call it a Neolithic blade industry.

TECHNOLOGY

The raw material includes various kinds of silica, among which coloured cherts—mainly of shades of brown—predominate, chalcedony is sometimes found and, more rarely, opal and quartz. These appear to have been obtained in the form of river pebbles or from amygdaloid deposits in the trap and Bhima limestones. There is evidence as we shall see later in considering other sites in the Doāb for the use of both these sources. The river pebbles, which may well have been themselves derived from the latter deposits, would obviously have been brought to Piklihal from the Krishna. The amygdules would have been obtained from farther afield but not necessarily much farther. There is a collection in the Hyderabad State Museum made some years ago by the Hyderabad Archaeological Department which throws some light upon a probable source. From Hegragi (Meadows Taylor's Hegaratgi), little more than twenty-five miles north-west of Piklihal, and situated on a spur of Bhima limestone comes a big collection of large typical waste material including also cores and partly prepared cores of coffee and chocolate coloured chert. This site may well have been a factory producing cores for the Neolithic settlements. However, much of the raw material evidenced at Piklihal seems to have been in the form of smaller, river worn, pebbles, although the Hegragi chert is to be found among large artifacts (e.g. the five blades from the grave in Site VIIIA already mentioned, p. 24). There was also much similar chert among the collections from the earlier excavations at Maski.

The technique of blade production appears to be identical wherever it occurs throughout the world. It is becoming possible to postulate its diffusion into India from the earliest centres in the Middle East. It depends upon a special technique of core production which was first recognized at Grand Pressigny in France in deposits of the Upper Palaeolithic. Since then the whole process has come to be clearly understood and is well described in many places. For India its classic description is that of Subbarao[1] at Maheshwar where the magnificent collections of tools exemplify beautifully every stage. It is not necessary for us to repeat the description. It is sufficient to point out that the method forms one of the first mass production processes, older than the discovery of the potter's wheel; and that once it had been achieved a single core could yield up to several dozen blades in a very short space of time (for example, Pl. 53, Nos. 13 and 15). The discarded cores and other by-products of the industry are easily recognizable. In Pl. 51, No. 1 is a small core of this type prepared for the removal of blades but for some reason never used for this purpose; No. 4 shows a core of this type from which a number of blades have been removed along one side only; No. 6 is a similar core from which blades have been removed on three sides; No. 2 is a minute core worked down to the very last, so that the final blades removed were barely one centimetre in length. We may note here that on account of the small size and irregularity of many of the nodules of raw material it was often only possible to remove blades from the more regular surface or surfaces of the core, as in No. 4. In the same plate (51), No. 5 illustrates the first flake to be struck from a prepared core such as No. 1; No. 7, the second such flake. Both these forms are typical by-products of blade manufacture and we shall refer to them respectively as primary and secondary guide flakes, they are also sometimes referred to as crested flakes. A percentage of the blades thus obtained were further treated by secondary working or retouch, that is to say the removal of minute flakes along one or both edges to produce various effects.

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[1] 'Chalcolithic Blade Industry of Maheshwar', *B.D.C.R.I.*, XVII (1955-6).

FUNCTIONAL

The classification of tools is most likely to be of value when it arises from an understanding of the processes of manufacture. It is next most likely to be meaningful if it leads us towards the functions for which the tools were intended. The available ethnographic and archaeological evidence for the hafting of the products of this industry has been sifted and discussed by my wife and shows that the following inferences can all be backed up by factual evidence from one source or another.[1] Once the blades are made, they can be used as they are as knives or spokeshaves, and for general cutting purposes. Many show heavy use marks which are consistent with such use (Pl. 52, No. 12). They may further be retouched so as to blunt or strengthen one edge, and used for similar functions (Pl. 52, No. 15). They may also be broken into sections of regular length for composite hafting in a wooden or bone haft, set in gum, to make knife and sickle blades. That the tools of the Piklihal blade industry were indeed used for this purpose can be inferred from the surprising regularity of size of many specimens (for example, Pl. 51, No. 20). Finally they may be broken into sections and retouched to make lunates and other so-called 'geometric' forms, for use as points or barbs of arrow-heads or spears; or blades may be so worked as to provide awl-like points used for boring purposes (Pl. 54, No. 34). Such a variety of geometric forms can be seen in Pl. 52; No. 5 is an unfinished specimen, Nos. 20 and 22 are broken; in Pl. 53, No. 5; in Pl. 54, Nos. 35, 39 and 42; and Pl. 51, Nos. 12–15. In fact the stone blades and their variants had a basic simplicity of manufacture, once the technique had been evolved, and a flexibility which made them valuable for a multiplicity of purposes, both to hunting and fishing groups, as well as to early agricultural societies. As such it may be safely assumed that their uses continued long after the introduction of metals, and would only finally disappear when iron became ubiquitous.

It will be observed that in general the blades and blade cores from Piklihal are extremely small when compared with the larger specimens recovered in the earlier excavations at Maski. It is obvious from what we have said that the size of a blade will depend upon the size of the core and that this in the first place will be limited by the raw material. The comparative rarity of large cores and the fact that cores were worked down to minute size both seem indicative of the scarcity of such raw material at Piklihal. The contrast presented to the uniformly large blades of Sukkur on the Indus is remarkable, particularly as the basic techniques of the industries are common. At Sukkur cores were discarded while still yielding blades of large size, as big as the largest found at Piklihal. That large blades were produced on occasions is shown by the grave group illustrated in Pls. 22*b* and 23, and by the size of guide flakes from various parts of the site, for example Pl. 52, No. 1.

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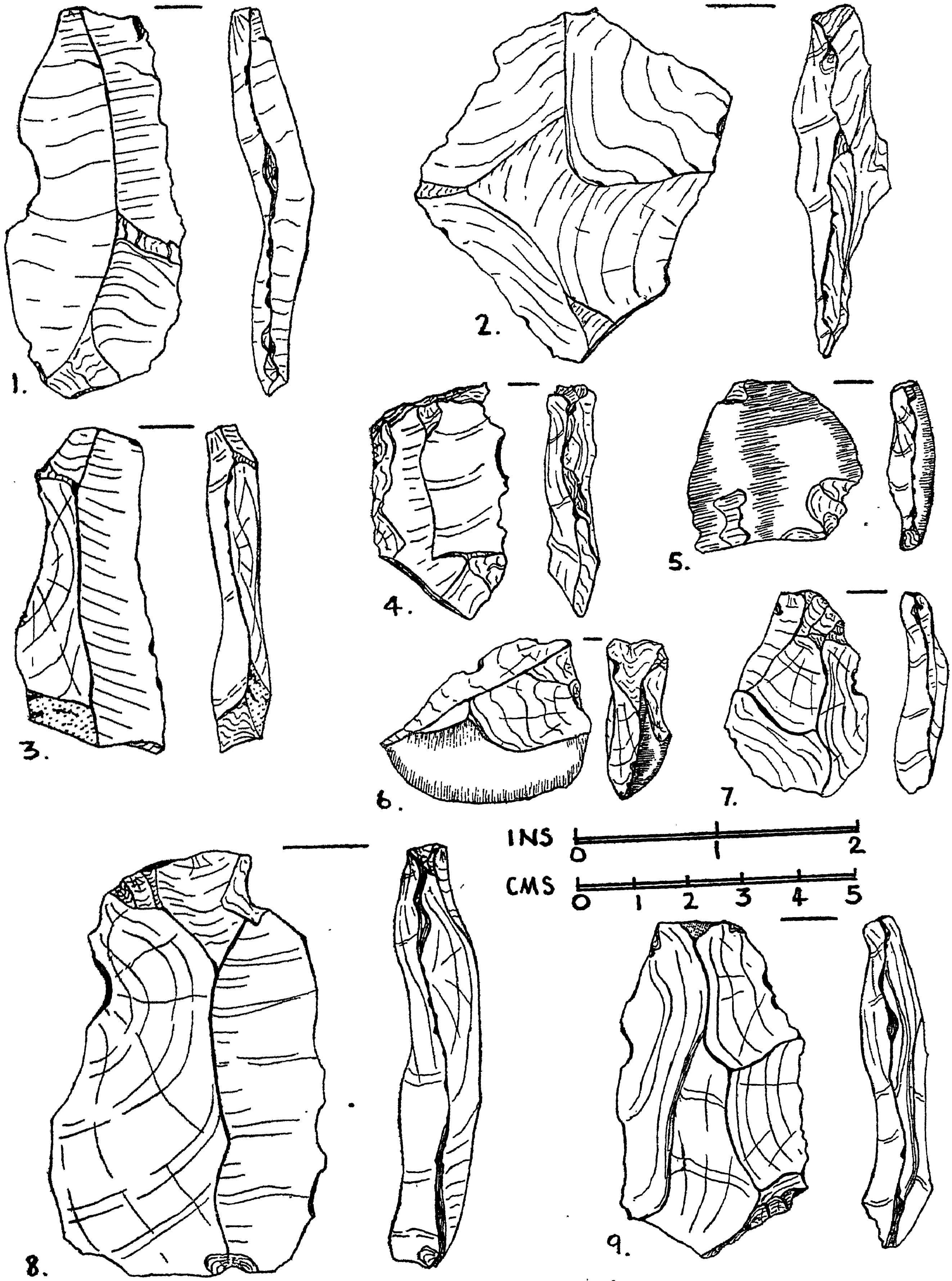
[1] See Bridget Allchin, 'Australian Stone Industries, Past and Present', *J.R.A.I.*, 87, Pt. 1 (1957). Also for an application of the above principles, see her paper in the same journal upon the 'Late Stone Age of Ceylon', *J.R.A.I.*, 88 (1958). The whole subject, including the Indian evidence, was dealt with by the same writer in her Ph.D. thesis for London University 'The Blade and Geometric Industries of Australia, Southern Africa and India' (1956), and I gratefully acknowledge my indebtedness to her here.

When we consider the stratigraphical occurrence of the tools we are faced by the strange fact that they occur throughout all levels of the site, without any discernible change, either in raw material or tool types. However, we have already noticed the same phenomenon in respect of the ground stone industry and to some extent of the pottery, although this appears in later layers in clearly worn and derived form. The explanation, as we have already stated, appears to be that the contents of the upper layers have been disturbed by ploughing, when the area was not actually occupied; have received cultural debris of other deposits from higher levels on the sides and tops of hills (we have noticed ample evidence to support their previous existence); and finally have tended to accumulate and be retained in those areas where stone retaining walls have been maintained, as indeed they have since very ancient times in most of the spots chosen for excavation.

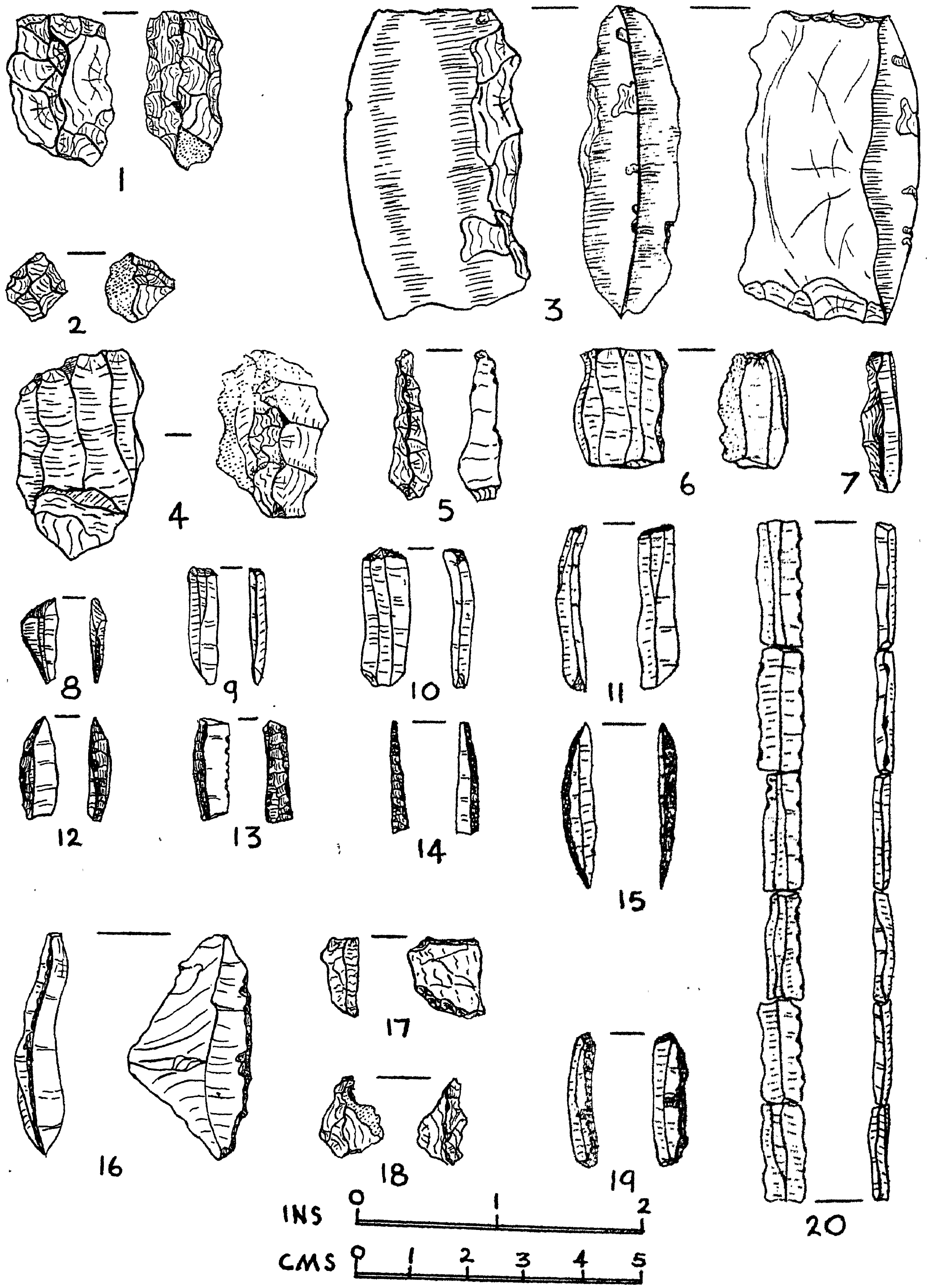
SURFACE COLLECTION

The typological study of the surface collection reveals the relative frequency of the various products of the industry:—

No.	*Type*	*Remarks*
56	Flakes ..	Of these flakes, the by-products of blade manufacture, 30 bear marks which indicate their use (Pl. 54, No. 31).
238	Blades ..	Of this total only 31 are complete, and nearly all show some signs of use; 104 are proximal ends, many with use marks, and these like the 83 central sections, which also bear signs of use in almost every case, on either one or both edges, show a remarkable overall unity of size and length. The majority are between 2 and 2·5 cm. long. On the other hand only four of the twenty distal ends show any signs of use, probably because all are very small and thin compared to the proximal and central sections. The presence of such large numbers of blade sections of similar length, all snapped from the parent blade neatly at right angles to the medial ridge, may suggest multiple hafting (Pl. 51, No. 20).
21	Backed blades ..	2 complete, 5 proximal ends, 9 central sections, 5 distal ends. Three have steep double retouch (Pl. 51, Nos. 12–16). One example (Pl. 54, No. 36) is so retouched as to approach the serrated blade type, which is otherwise not represented in the surface collection.



Basalt flakes and blades



Neolithic blade industry: surface find

No.	*Type*	*Remarks*
5	Truncated blades	Have had the ends retouched only, so as to make minute end scrapers. Whether the truncation was functional or merely designed to improve finger grip it is impossible to tell (Pl. 54, No. 37; Pl. 51, Nos. 9, 10 and 11).
1	Scraper	A single example of a slightly convex side scraper on a flake (Pl. 51, No. 16).
1	? Graver	A single small piece worked on two sides so as to provide a graving edge (Pl. 51, No. 17).
1	*'Eloura'*	A large thick lunate steeply retouched on both sides, resembles the Australian *eloura*, hafted in gum to make a woodworking tool (Pl. 51, No. 19). (*See* B. Allchin, *loc. cit.*, *J.R.A.I.*, 1957, p. 120 and Fig. II, No. 8.)
3	Lunates	Two are particularly long and slender (Pl. 54, Nos. 35 and 42), the third is shorter (Pl. 54, No. 39).
2	Triangles	Both are of the scalene type and have the tip snapped off at the most acute angle. One specimen is retouched along two sides, the other along one side only, the second side, usually retouched, being formed by a twisted break running diagonally across the blade (Pl. 51, No. 8).
3	Awls	(Pl. 51, No. 18; Pl. 54, No. 34.)
19	Blade cores	(Pl. 51, Nos. 1, 2, 4, 6.)

SPECIMENS FROM SITE VII

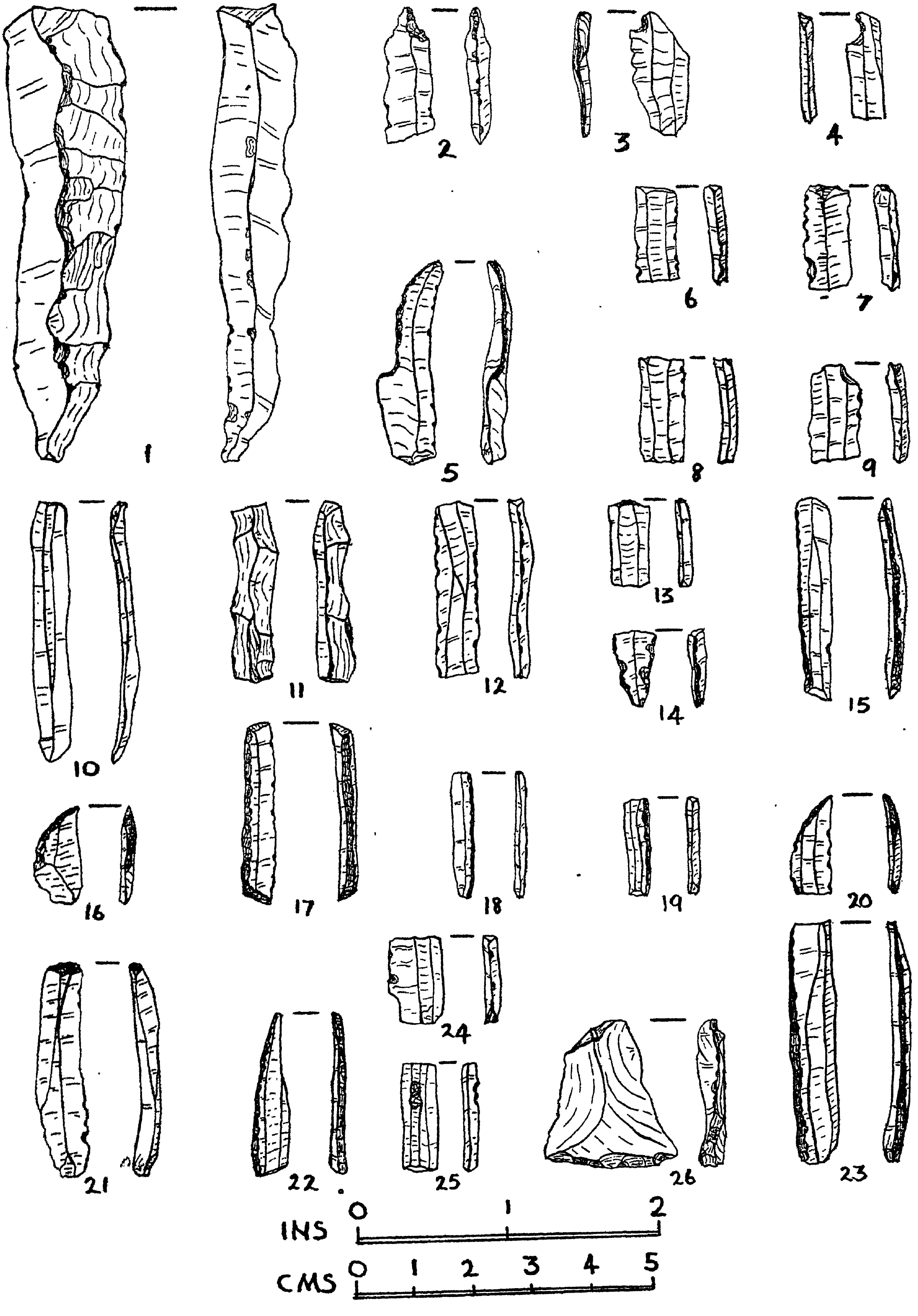
Table 1 shows the occurrence of the tools of the blade industry in Site VII where it appears most solidly stratified. From this table it can be seen that apart from layers 0 and 1 nearly every layer has examples of lunates or backed blades. Nevertheless it does appear as if the industry is already present in fully evolved form in the Lower Neolithic (layers 10-11), that it continues in unabated form in the Upper Neolithic (layers 6–9), and declines sharply thereafter. This is supported by the figures from Mr. Thapar's excavation at Maski in 1954, and constitutes the best stratigraphical evidence for this industry at Piklihal. We shall now list a selection of types from the site illustrated in Pl. 52. As there appears to be absolutely no correlation between the raw material and type we shall not note the former.

Pl. 52,	1.	Large secondary guide flake	Site VII, layer	6
	2.	Section of blade, notched at each end	,, ,, ,,	6
	3, 4.	Micro-burins	,, ,, ,,	7
	5.	Retouched blade, (?) unfinished lunate	,, ,, ,,	10
	6.	Central section of used blade	,, ,, ,,	4
	7.	,, ,, ,, ,, ,, with retouch on end	,, ,, ,,	6
	8.	,, ,, ,, ,, ,,	,, ,, ,,	8
	9.	,, ,, ,, ,, ,,	,, ,, ,,	6
	10.	Complete blade without signs of use	,, ,, ,,	0
	11.	Primary guide flake	,, ,, ,,	1

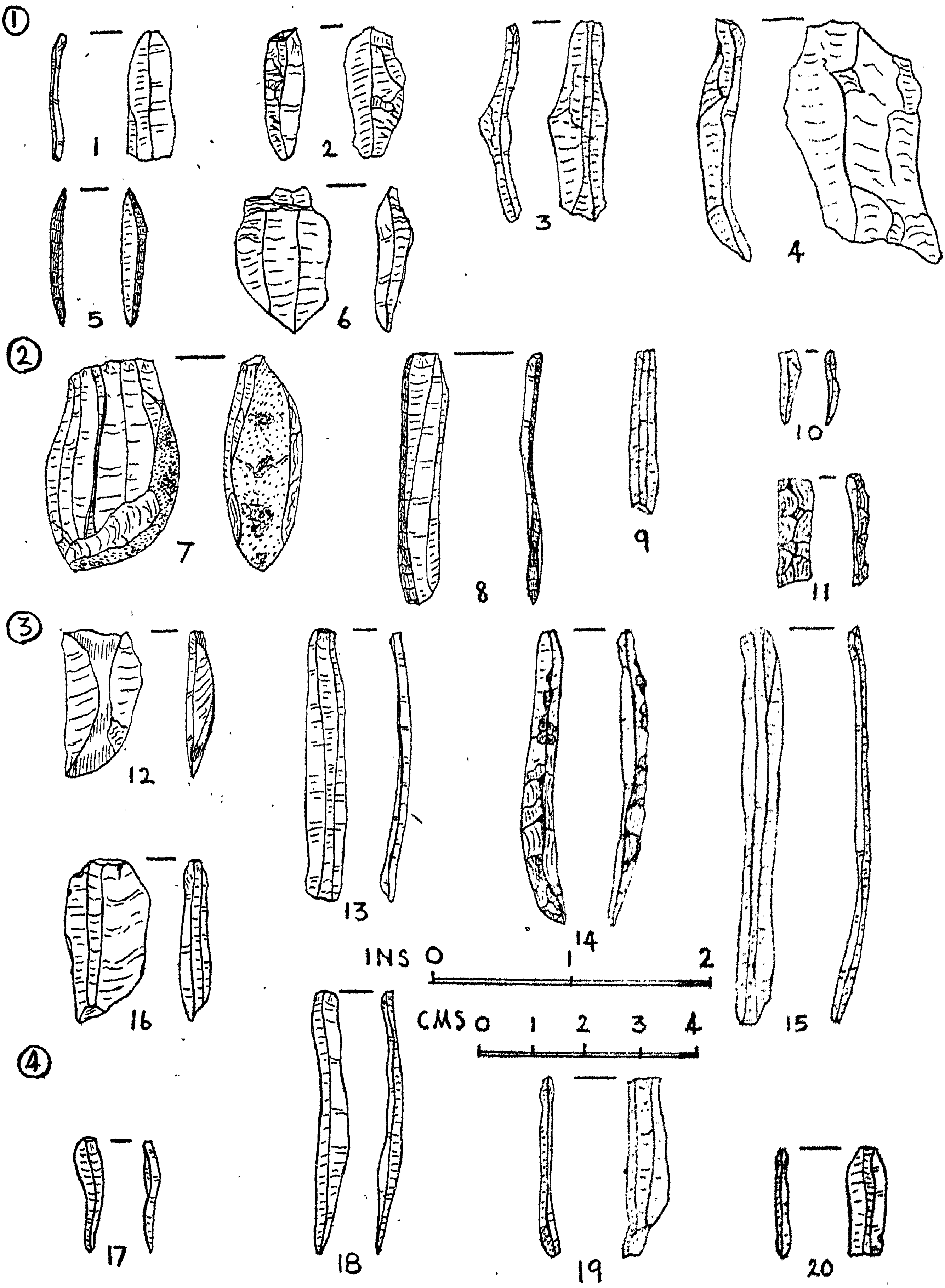
TABLE 1, SITE VII, STONE BLADE INDUSTRY

Layer	Cores	Pieces	Flakes	Blades	Micro-burins	Guide flakes		Backed blades	Truncated blades	Geo-metrics	Awls	Scrapers	Discoid	Layer
						Primary	Secondary							
0	1	..	11	37	..	1	1	..	..	..	..	..	..	0
1	..	1	8	7	..	1	1	..	..	..	..	..	..	1
2	..	..	20	40	..	1	..	1	..	1	..	..	..	2
3	..	..	4	27	..	2	..	2	..	..	1	..	..	3
4	1	2	16	31	..	1	1	3	..	1	..	..	1	4
5	..	..	7	20	..	..	..	..	..	..	1	..	..	5
6	1	..	22	26	..	2	1	2	1	..	1	..	..	6
7	1	..	42	55	2	4	2	..	..	1	..	..	..	7
8	..	1	7	27	..	2	1	2	..	..	..	..	..	8
9	..	..	29	59	..	..	5	..	1	2	..	1	..	9
10	1	..	14	25	..	3	..	1	..	1	..	..	..	10
11	..	..	24	39	..	7	2	1	..	1	..	2	..	11
Total	5	4	204	393	2	24	14	12	2	7	3	3	1	

PLATE 52



Neolithic blade industry: Site VII



Neolithic blade industry: Site I, upper layers

TABLE 2, SITE 1, STONE BLADE INDUSTRY

Layer	Cores	Pieces	Flakes	Blades	Micro-burins	Guide flakes		Backed blades	Truncated blades	Geo-metrics	Awls	Scrapers	Discoid	Layer
						Primary	Secondary							
1	2	2	3	24	..	..	..	..	..	2	..	..	..	1
2	2	6	2	57	..	1	..	2	..	1	..	..	..	2
3	1	5	8	21	..	2	..	..	..	..	..	..	..	3
4	..	2	3	29	..	..	..	1	..	..	..	..	..	4
5	..	..	3	20	..	..	..	..	..	2	..	..	..	5
6	..	..	..	22	..	..	1	1	..	2	..	..	..	6
7	..	3	2	2	..	..	..	..	..	..	..	..	..	7
8	..	..	..	24	..	1	..	..	..	1	..	..	..	8
9–12	..	..	..	..	..	..	..	..	..	..	..	..	..	9–12
Total	5	18	21	199	—	4	1	4	—	8	—	—	—	

Pl. 52,	12.	Used blade	Site	VII,	layer	2
	13.	Central section of blade, worked at one end	,,	,,	,,	3
	14.	(?) Point, worked on both sides, (?) broken awl	,,	,,	,,	4
	15.	Complete backed blade	,,	,,	,,	6
	16.	Point, trimmed on one side only	,,	,,	,,	4
	17.	Truncated backed blade	,,	,,	,,	4
	18.	Backed blade	,,	,,	,,	8
	19.	Backed blade	,,	,,	,,	8
	20.	Broken lunate	,,	,,	,,	11
	21.	Blade with retouched end	,,	,,	,,	10
	22.	Point, worked on one side only	,,	,,	,,	10
	23.	Backed blade	,,	,,	,,	11
	24.	Central section of blade	,,	,,	,,	10
	25.	,, ,, ,, ,,	,,	,,	,,	10
	26.	End scraper on flake	,,	,,	,,	11

SITE I

Table 2 shows the finds of blade tools in Site I. The evidence here is much less convincing and reflects the nature of the site, in that while Site VII was largely in an actual living area, Site I was perhaps on open ground outside the hutment areas. It is nevertheless strange that while the site yielded

Pl. 53,	1.	Bulbar end of blade	Site I,	layer	1
	2.	Flake	,,	,,	
	3.	Irregular blade	,,	,,	
	4.	Flake	,,	,,	
	5.	Lunate	,,	,,	
	6.	Flake	,,	,,	
	7.	Blade core	,,	,,	
	8.	Backed blade	,,	,,	2
	9.	Blade	,,	,,	
	10.	Minute blade	,,	,,	
	11.	Section of primary guide flake	,,	,,	
	12.	Flake from basalt axe	,,	,,	
	13.	Complete blade	,,	,,	3
	14.	Primary guide flake	,,	,,	
	15.	Large complete blade	,,	,,	
	16.	Flake	,,	,,	
	17.	Minute blade	,,	,,	
	18.	Blade	,,	,,	4
	19.	Blade	,,	,,	
	20.	Bulbar end of blade	,,	,,	
Pl. 54,	21.	Flake	,,	,,	
	22.	Section of blade	,,	,,	5
	23.	Bulbar end of large blade	,,	,,	
	24.	Broken lunate	,,	,,	
	25.	Central section of large blade	,,	,,	
	26-8.	,, ,, ,, ,, ,,	,,	,,	7
			,,	,,	

TABLE 3, SITE VIIIA, STONE BLADE INDUSTRY

Layer	Cores	Pieces	Flakes	Blades	Micro-burins	Guide flakes		Backed blades	Truncated blades	Geo-metrics	Awls	Scrapers	Discoid	Layer
						Primary	Secondary							
1	..	..	2	22	..	..	..	1	1	..	..	..	..	1
2	4	..	10	72	..	..	1	3	..	3	..	..	..	2
3	..	..	4	21	..	1	..	3	..	..	..	..	..	3
4-5	2	..	11	68	..	..	..	1	..	6	..	..	..	4-5
Total	6	—	27	183	—	1	1	8	1	9	—	—	—	

TABLE 4, SITE VIIIB, STONE BLADE INDUSTRY

Layer	Cores	Pieces	Flakes	Blades	Micro-burins	Guide flakes		Backed blades	Truncated blades	Geo-metrics	Awls	Scrapers	Discoid	Layer
						Primary	Secondary							
1	5	..	5	39	..	3	..	2	..	..	..	..	..	1
2	1	..	6	46	..	..	..	3	..	..	..	..	..	2
3	..	..	2	21	..	..	..	3	..	2	..	..	..	3
4	..	..	..	7	..	..	..	..	..	..	..	..	..	4
5-6	1	..	6	23	..	..	..	1	..	1	..	..	..	5-6
7	..	..	..	5	..	..	..	1	..	..	..	..	..	7
8	..	..	4	6	..	..	..	2	..	..	..	..	..	8
9	..	..	2	2	..	..	..	..	..	..	..	..	..	9
Total	7	—	25	149	—	3	—	12	—	3	—	—	—	

TABLE 5, TOTALS FROM ALL SITES, STONE BLADE INDUSTRY

Total	Cores	Pieces	Flakes	Blades	Micro-burins	Guide flakes		Backed blades	Truncated blades	Geo-metrics	Awls	Scrapers	Discoid
						Primary	Secondary						
Site I	5	18	21	199	. .	4	1	4	. .	8	. .	. .	. .
V	1	. .	1	23	. .	. .	. .	2	. .	. .	. .	1	. .
VI	2	5	5	26	. .	. .	. .	3	. .	4	1	. .	. .
VII	5	4	204	393	2	24	14	12	2	7	3	3	1
VIIIA	6	. .	27	183	. .	1	1	8	1	9	. .	. .	. .
VIIIB	7	. .	25	149	. .	3	. .	12	. .	3	. .	. .	. .
IX	. .	3	35	73	. .	. .	2	9	. .	. .	1	. .	. .
Surface	19	. .	56	238	. .	. .	. .	21	5	6	4	1	. .
Grand Total	45	30	374	1,284	2	32	18	71	8	37	9	5	1

plentiful pottery of the Neolithic period, the blade industry should be comparatively poorly represented. It is also strange that there should be so many blades, although admittedly they are poor ones, in layer 2 which as we have seen contains early historic pottery. We shall now list a selection of the tools from this site, layer by layer.

SITE VIII

Tables 3 and 4 show the occurrence of tools of the industry in Sites VIIIA and B. A notable feature of Site VIIIA was the presence of six lunates all made of similar chert and of about the same size. There is a suggestion in this unusual density of this comparatively rare type that their presence may have had some special significance which was not fully revealed. Site VIIIB is in no way remarkable.

SITES V, VI AND IX

Finally Table 5 lists the scanty total occurrences in the remaining sites which produced any examples of this industry, together with the totals from the sites already listed and from the surface collection.

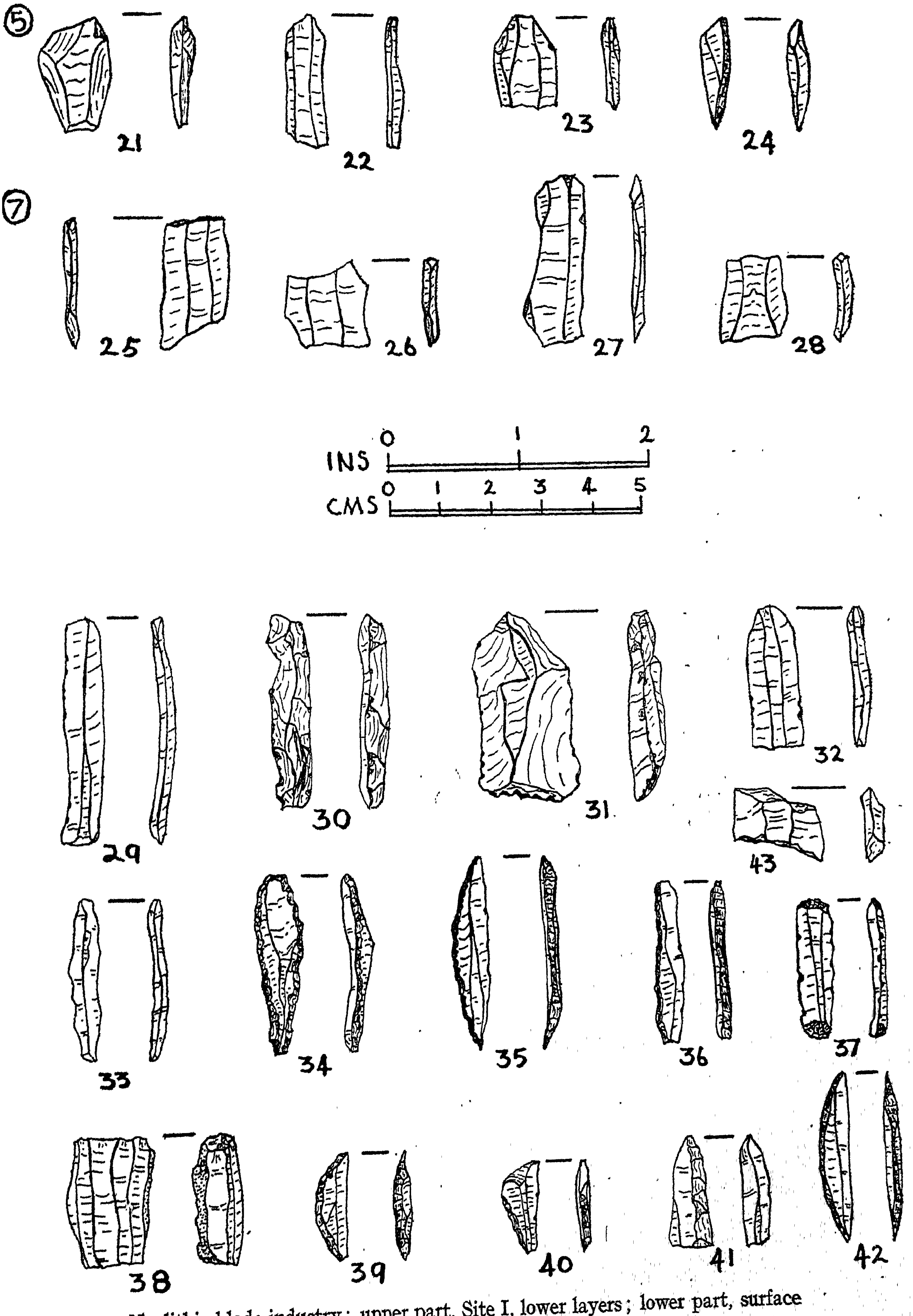
CONCLUSION

From these figures it emerges that blades occupy about 67% of the total collection, cores 2·35%, backed blades and truncated blades treated as one group 4·11% and geometrics 1·9%. The total sample is of 1,916 specimens. For reasons already stated the blade industry is of a stereotyped character: a character which is repeated wherever the basic techniques were employed. In this situation it is not easy to make any detailed comparison with other sites unless adequate typological and statistical material is provided. Thus we may make comparison with Maski, since Mr. Thapar's report contains such detail, or again with Maheshwar. Both these comparisons show how closely related are the industries. But when we seek for its origins we are baffled by the very inadequate nature of the reports. From observation it is possible to state that the blade industry of the Indus civilization is closely similar, but in none of the excavations so far published from that region have the stone assemblages been at all adequately described. In several sites of Baluchistan the position is the same. At Sialk, Hissar and Shah Tepe, a blade industry of the same type survived into the second millennium B.C., but in no case is the published report sufficiently detailed to make possible closer comparison. At Hissar, for example, Schmidt makes the comment that there was no noticeable change in the tools from Periods I to III. In short, it is perfectly reasonable to seek the origin of the Deccan Neolithic blade industry in the Chalcolithic and Neolithic blade industries of the Indus valley, Baluchistan and Iran, but closer comparison is not yet possible.

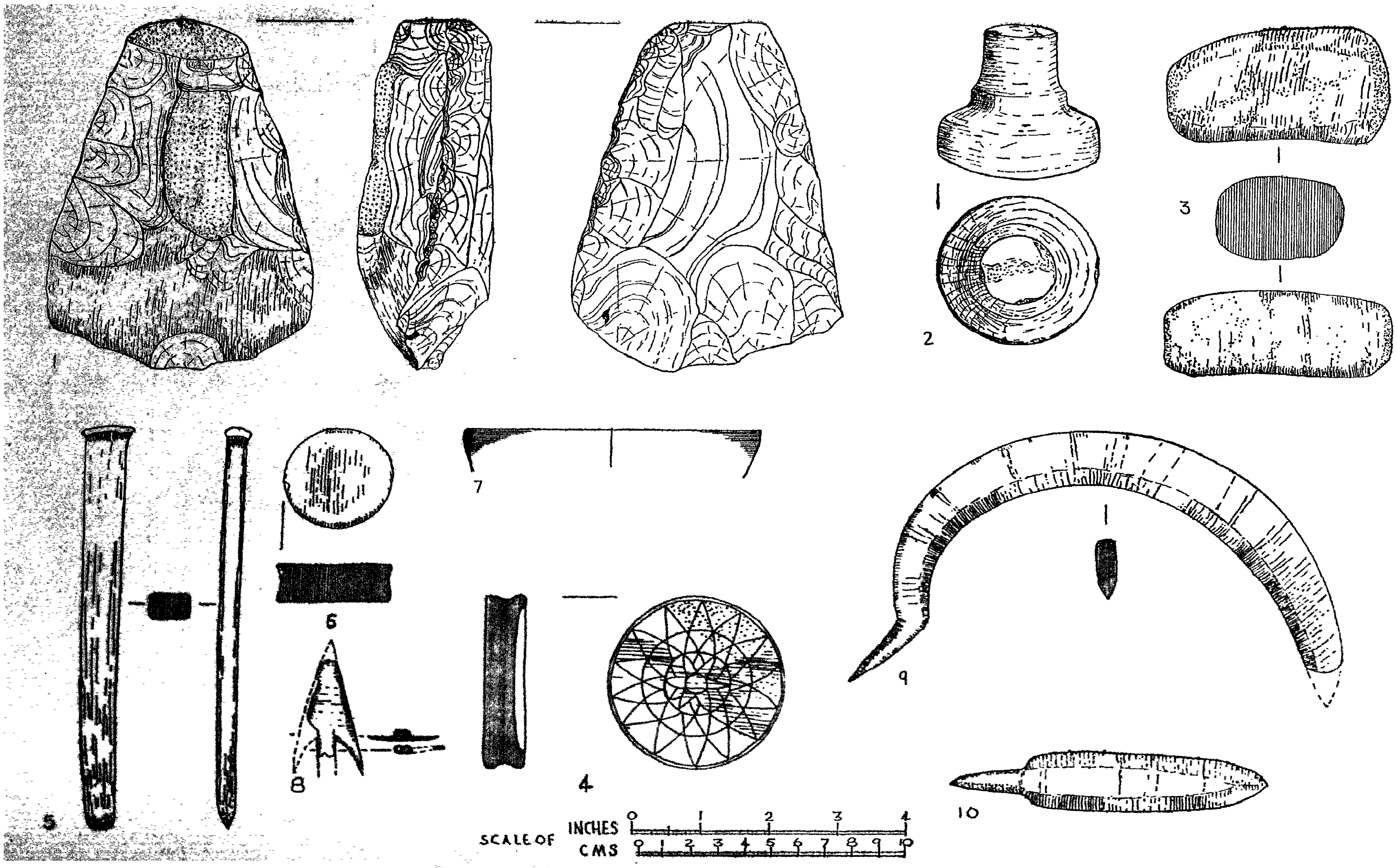
5. METAL OBJECTS

Objects were found of copper, iron and silver. It is not surprising as so much of the excavation was of levels of Neolithic age that the number of metal objects was so small. From the Neolithic levels no metal object can certainly

PLATE 54



Neolithic blade industry: upper part, Site I, lower layers; lower part, surface



Objects of metal, miscellaneous stone objects be assigned to the Lower Neolithic, while from the Upper Neolithic come a copper chisel and, from the uppermost part of the period, two fragments of a copper bowl. Assignable to the Iron Age are a small copper bell, a fragment of iron and two iron riveted strips. To the early historic period belongs a pit deposit including an iron knife, arrow-head, and sickle, a copper-plated disc and a small hammered copper hook. Perhaps to the same period may be assigned a copper bangle which unfortunately disappeared before it could be registered. Finally from a medieval level comes a broken silver toe-ring. When the paucity of metal objects is considered, particularly with regard to the Neolithic period, against the numerous finds of stone axes and blade tools, it will be seen that the period cannot have relied upon metal for the tools of daily use: in these circumstances the appropriateness of the term Neolithic is quite clear.

COPPER AND BRONZE

1. *Copper chisel, rectangular section, length 6·25 in., breadth 0·6 in., thickness 0·3 in. The chisel has evidently been hammered out of a bar of copper, the head has been slightly turned over by application of hammer blows. This object was found at the bottom of layer 3, on the surface of layer 4, in Site VIIIA. It bears a close typological resemblance to copper chisels of the Indus valley civilization[1] (Pl. 55, No. 5 and Pl. 56*b*, No. 10).

2. *Two fragments of the rim of a small copper bowl. They come from Site VII, layer 6, and thus date from the end of the Upper Neolithic. The metal has been analysed, no tin or other alloy was found. The form may be compared with similar bowls from Adichanallur,[2] and with others from the graves at Souttoukeny[3] (Pl. 55, No. 7 and Pl. 56*b*, Nos. 1 and 3).

3. A bangle of (?) copper or bronze, found as a surface find in Area D. The section and form closely resembled a specimen from the early historic period at Brahmagiri.[4] This piece disappeared before it could be registered.

4. Copper disc, (?) ear ornament, found in a pit deposit with other metal objects, in Site VII, layer 2, dating to the early historic period. The specimen has been analysed and reported to be copperplate beaten over a burnt clay core. Many comparable discs of terracotta and even stone are known from earlier excavations at Maski, and perhaps they too originally had metal plate or gilt covering[5] (Pl. 55, No. 5 and Pl. 56*b*, No. 4).

5. Hook of beaten copper, from similar provenance to No. 4 above[6] (Pl. 56*b*, No. 5).

Objects marked with an asterisk were examined by Professor Bhat, of the College of Mining and Metallurgy, Benares, and identified by him.

[1] Compare Sir John Marshall: *Mohenjo-daro and the Indus Valley Civilization*, Pl. CXXXV, Nos. 11, 14; and Vats, *Harappa*, Pl. CXXIII, Nos. 49, 54, etc.

[2] Rea, A.: *Catalogue of Prehistoric Antiquities*, Pl. II, No. 14, etc.

[3] Casal, J. M.: *Site Urbain et Sites Funéraires*, Fig. 33.

[4] *Ancient India*, No. 4, *loc. cit.*, Fig. 41, No. 8.

[5] Compare a fine example of jasper with repoussé gold plating from Somnath, *Indian Archaeology*, 1956-57, p. 17.

[6] Compare Brahmagiri, iron, *Ancient India*, No. 4, *loc. cit.*, Fig. 40, No. 42.

6. Small bell of copper or bronze formed by bending over two halves of concave form, leaving loop at top and opening at joint. Compare Brahmagiri[1] and Maski.[2] This specimen comes from the entrance way to the grave, Site IV. Not illustrated.

7. Unrecognizable fragment of copper, Site I, layer 2.

8. A similar fragment from the same provenance as No. 7 above.

IRON

9. Iron sickle recovered from the lined pit in Site VII, layer 2, along with other objects of iron and the copper disc and hook already listed. The form is strictly comparable to that of iron sickles from many graves in South India, and is common to sickles from Sanchi, Taxila and other sites in North India (Pl. 55, No. 9 and Pl. 56*b*, No. 9).

10. Iron knife with straight blade and tanged haft. The form is widely met with in South Indian grave sites. From provenance similar to No. 9 above (Pl. 56*b*, No. 7 and Pl. 55, No. 10).

11. Part of an iron arrow-head from similar provenance to No. 9 above. The form is common at Adichanallur,[3] and an example occurred at Brahmagiri[4] (Pl. 55, No. 8 and Pl. 56*b*, No. 2).

12. Flat strip of iron with small iron nails or rivets at either end. Length 2 in., breadth $\frac{3}{4}$ in., thickness about $\frac{1}{8}$ in. The thickness of the rivets is about $\frac{1}{6}$ in. From Site VI, layer 3, assignable to the Iron Age.

13. Strip of iron of similar size from similar context, but without rivets.

14. Formless fragment of iron. Site VII, layer 4.

SILVER

15. Broken piece of silver toe-ring from the medieval settlement area, Site V, layer 4.

6. COINS

Only three coins were obtained during the excavations, all came from a late, medieval, pit in Site VIIIB. A single other surface find was identified as a silver punch-marked coin but disappeared before it could be registered.

1. *Obv.* Blank.
   Rev. Illegible, a single line divides it into two halves.
   Metal: copper; *size:* 15 mm.; *shape:* round; *condition:* worn.
2. *Obv.* Blank.
   Rev. Blank.
   Metal: copper; *size:* 16 mm.; *shape:* near round; *condition:* worn.
3. *Obv.* Illegible, ? bull.
   Rev. A single line divides it into two halves.
   Metal: copper; *size:* 15 mm.; *shape:* round; *condition:* worn.

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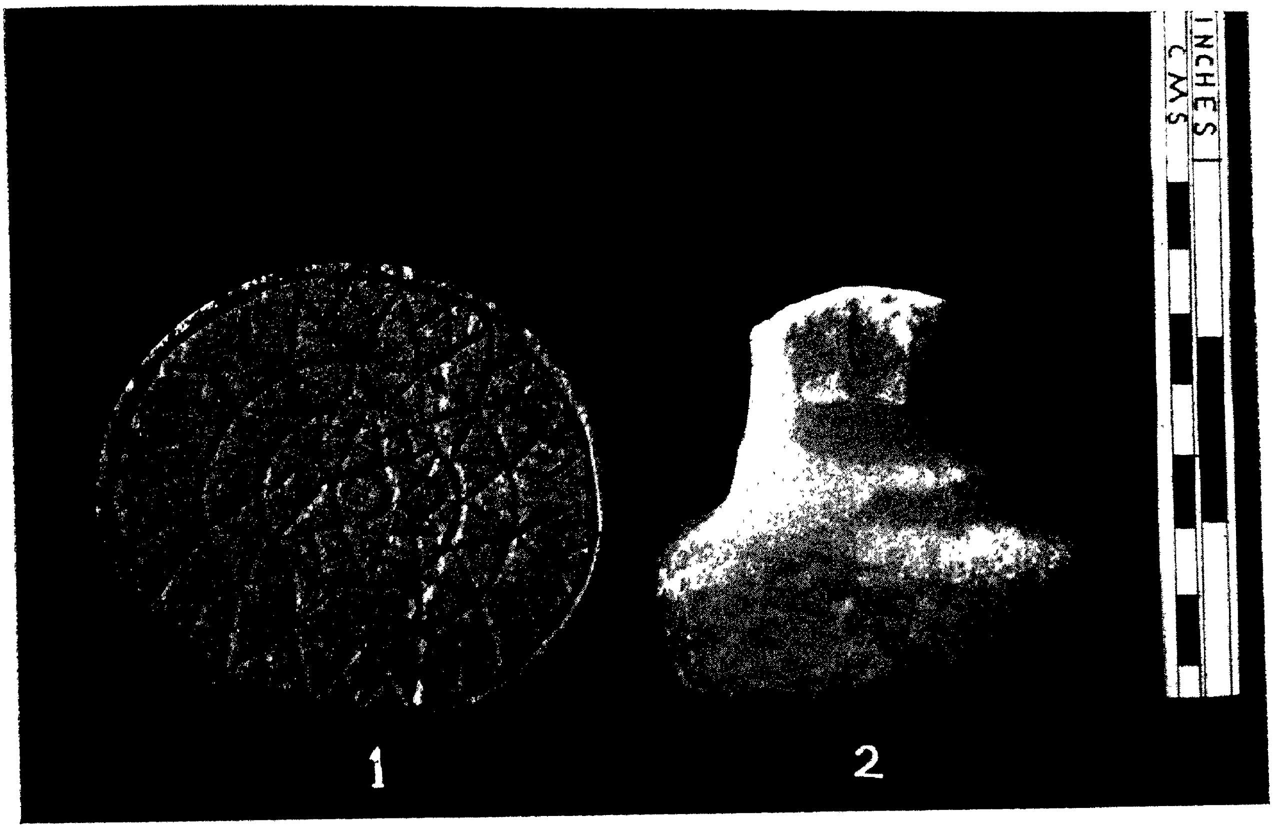
[1] *Ancient India*, No. 4, *loc. cit.*, Fig. 41, No. 9.

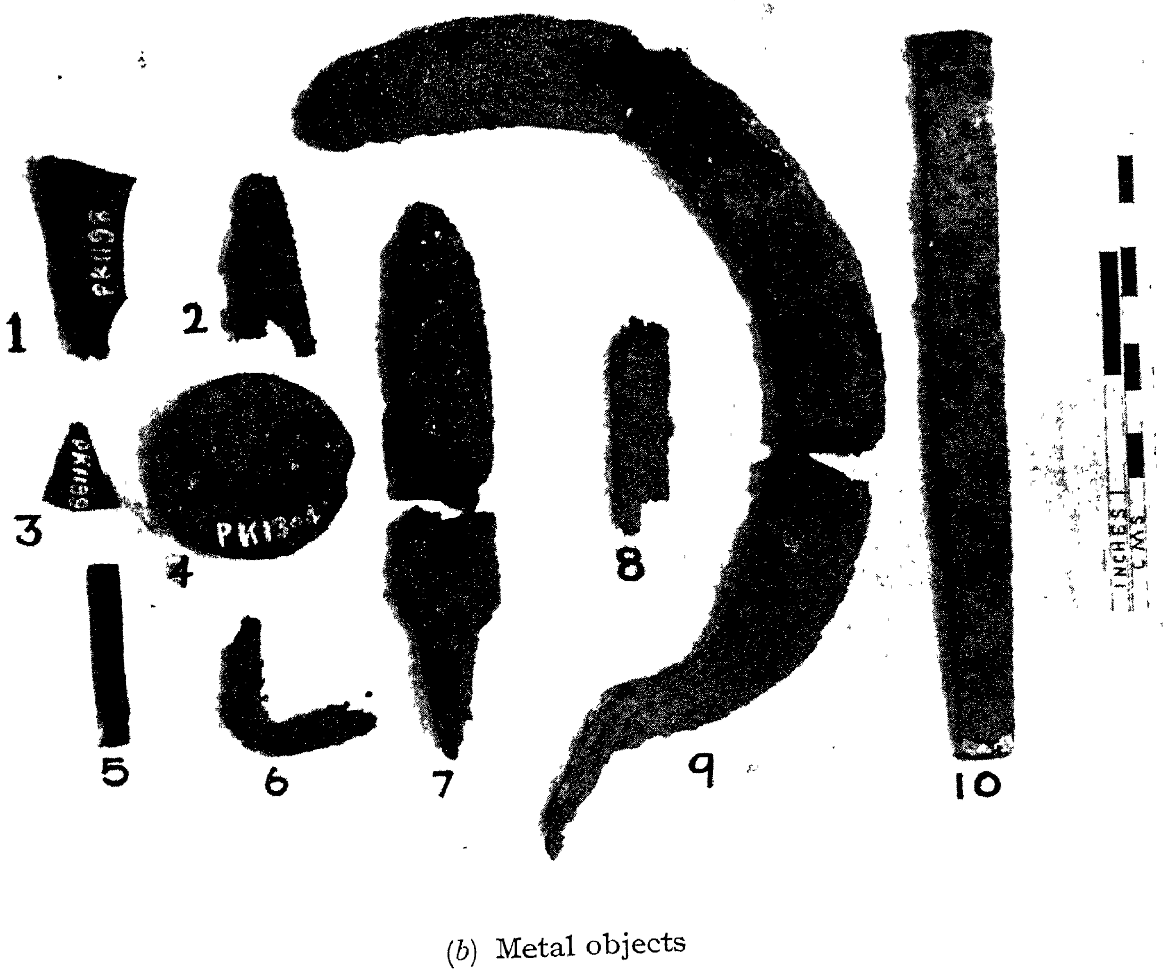
[2] *Ancient India*, No. 13, *loc. cit.*, Fig. 34, No. 7.

[3] Rea, A.: *Catalogue of Prehistoric Antiquities* (Madras, 1915), Pl. 3, No. 13.

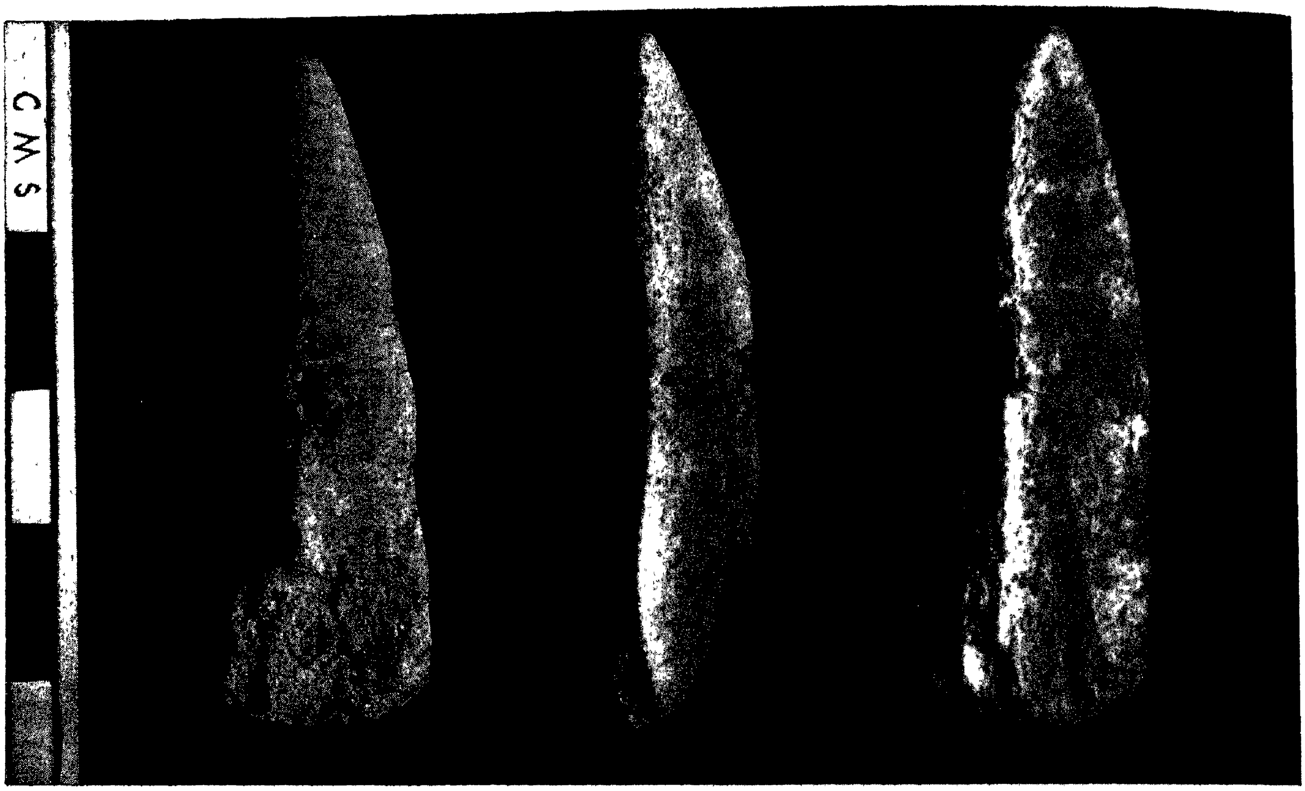
[4] *Ancient India*, No. 4, *loc. cit.*, Fig. 38, No. 27.



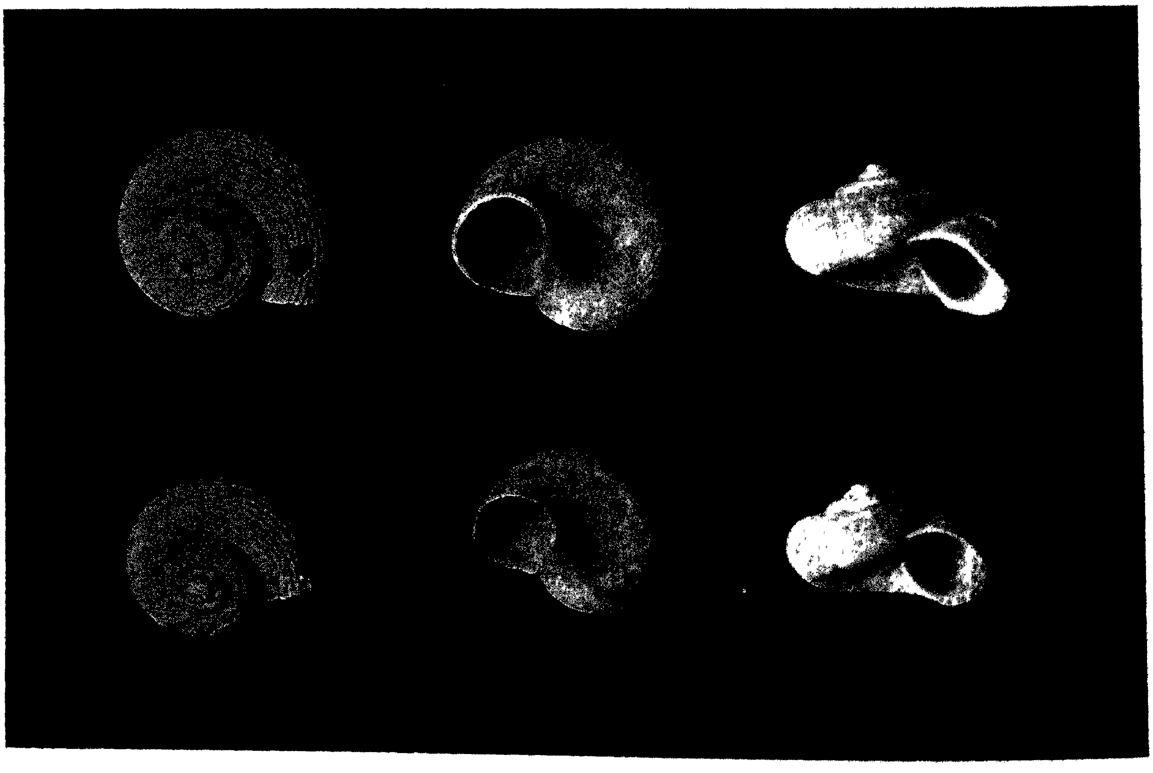
(*a*) Stone disc and pounder



(*b*) Metal objects



(*a*) Worked bone point



(*b*) Species of cyclophoridae (2 × natural size)

Coins 1–3 were found in the pit excavated from layer 2 of Site VIIIB. The pit appears to date from medieval times, it contained some medieval pottery, iron slag, etc. It is inferred that the reverse carried a *devanāgarī* inscription, and thus that the three coins probably belonged to the little-known copper currency of the Vijayanagara kingdom.

4. The fourth coin was a surface find in Area A between Sites VII and IX. It appeared, at the time of discovery, to be a thin silver coin of square shape in good condition with punch-marked symbols on one side, if not on both sides. However, before it could be further examined it disappeared.

7. BEADS

Ninety-six beads were recovered during the excavations. The majority came from the uppermost, mixed, layers, in which we have seen that earlier materials, particularly of the more durable kinds, occur side by side with later. It is thus possible that many of the beads found in such layers derive from the earlier periods, but there is no evidence which can prove this. The finds at Piklihal are particularly poor when compared with the great numbers recovered in the earlier excavations at Maski, and even poor when compared with the excavations there in 1954. The reason seems to be that whereas Maski throve and grew in importance during the early historic period, Piklihal's importance diminished. Thus finds of the Neolithic period are comparatively more abundant, finds of the early historic less.

The following table sets out the distribution of beads according to their raw materials and distribution in periods:

Material	*Medieval, and mixed deposits*	*Early historic*	*Iron Age*	*Neolithic*
Rock crystal ..	1	2	..	..
Agate ..	..	1	..	..
Bloodstone ..	2	1	..	..
Carnelian ..	7	1	7	1
Chert ..	3	..	..	..
Lapis lazuli ..	3	2	..	..
Other stone ..	..	1	..	..
Shell and magnesite	30	10	2	5
Terracotta ..	3	2	..	..
Glass ..	1	5	..	..
Lac ..	2	..	..	..

Rock crystal is represented by three examples, the first is a long barrel hexagonal (Site I, layer 1), the two others come from pit 1 (Site VII, layer 2), one is a large short bicone hexagonal, the other a broken long convex bicone seven-sided bead.

Agate is represented by a single standard barrel circular from Site I, layer 2.

Bloodstone is represented by two large spherical beads from layers 4 and 5 of Site V. They probably date from the early medieval period. A third bead of this type comes from a mixed layer of Site VI, and is probably assignable to the early historic period.

Carnelian is the second most common material for beads at Piklihal. Seven examples come from medieval or mixed layers, one from the early historic and no less than seven specimens from levels assignable to the Iron Age; finally a single example comes from a level dating from the transition of Upper Neolithic—Iron Age. This specimen is a standard barrel circular of medium size from Site VII, layer 6; two specimens have been etched and a third is whitened but without any blackening.

3	short bicones, very small	I	1
1	long cylinder circular, etched with white bands enclosing two wavy bands, i.e. type I.[1] A similar type comes from the earlier excavations at Maski	I	1
1	carnelian spherical	I	3
1	standard barrel circular, small	V	2
1	short bicone, very small	VI	2
1	spherical, etched by type II method,[1] of pattern 6 with pentagonal lines in black on white	VII	0
1	standard truncated convex bicone, medium	VII	4
1	spherical whitened by type II[1] but without etched black lines	VII	4
1	standard barrel circular, medium size	VII	6
4	bicone discs, small	VIIIA	3
1	standard truncated convex bicone	VIIIB	4

Chert is used for three beads, a short convex bicone from the surface of Site I, and two small long cylinder circular beads from the lowest level of Site V (early medieval).

Lapis lazuli is represented by five beads; from the surface of Site I comes a square cylinder, engraved on one side with lines, and one long cylinder circular with double perforation, broken. Another long cylinder circular comes from Site VII, layer 1, and from pit 1, layer 2 of the same site comes a spherical small bead. A similar bead comes from Site VIIIA, unstratified.

A small white bicone from Site I, layer 2, was in unidentified white stone.

Shell, magnesite or *steatite* includes half the total number of beads from the site. Five disc cylinder circular beads come from the Neolithic levels, two of the same type from the Iron Age levels, ten from the early historic and the remaining thirty from later and mixed levels. Other types represented include the long cylinder circular, short cylinder circular, square cylinder, each with a single example; there are four standard barrels, and one irregular pentagon standard convex bicone. The material of many of the discs was not determined; the majority appear to have been of magnesite, or steatite paste, while other forms were mainly in shell.

Terracotta is represented by five beads, three spherical large from the uppermost level of Site VII dating from the early historic period.

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[1] Dikshit, M. G.: *Etched Beads in India* (Poona, 1949), p. 10.

Glass: only six specimens of glass beads were found, none can certainly be ascribed to a pre-medieval date. Five examples came from Site I, layer 2, and a single other example from Site VIIIB. All are spherical small beads, of pale green glass.

Finally two beads of *lac* occurred in a mixed layer of Site VIIIB, both were roughly standard barrel medium sized.

We see that the only specimens belonging to the Neolithic period are of carnelian, magnesite or shell. The disc cylinder beads have not been accurately determined. The majority of them seem to have been of a magnesite (following the identification of similar beads at Brahmagiri) but a minority, as well as most of the other cylinder and barrel forms, were in shell. The occurrences can be closely compared with those of the 1954 excavations at Maski, and of Brahmagiri, and Bahal, Periods I-II. Similar disc beads have been reported at several sites in Sind and Baluchistan, including Nal,[1] Periano Ghundai,[2] Lohumjo Daro,[3] Chanhu Daro,[4] etc., where they are described variously as being of steatite, bone, paste, etc. At Jhukar they occurred in the lower prehistoric levels of mound A.[5] At Mohenjo Daro Marshall notes that such discs are most common in the Late and Intermediate periods,[6] while at Harappa Vats notices that they are of common occurrence in all strata.[7] The Harappa discs are described as of burnt steatite. At Chanhu Daro again Mackay comments on the 'wafer' beads of glazed steatite which he notes to have been extremely popular at all Indus valley sites.[8] It would seem to emerge that at sites of the Indus civilization these white steatite, paste or shell disc beads were of common occurrence. It may well be that at the other sites noticed they are present as objects of trade brought from the Indus cities, but it is not yet clear where their centre of manufacture was. It is thus quite within the bounds of possibility that they reached the Neolithic sites of the Deccan from the Indus valley in the form of objects of exchange, or alternately that they were brought first to the Deccan by nomadic peoples who had acquired either the beads themselves or the technique of making them, while they were passing through the Indus valley region.

8. OBJECTS OF GLASS, WORKED SHELL, BONE AND STONE

GLASS

The only type of glass objects discovered during the excavations were fragments of bangles. Of these thirty-seven came from the area of the medieval settlement (Site V) and twenty-one from the topmost layer of Site I. None need therefore be earlier than medieval. In all the layers ascribable to the early historic period glass was notably absent. The following is a catalogue of the various varieties of glass found.

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[1] Piggott, S.: *Prehistoric India*, p. 92.

[2] Stein, Sir A.: *M.A.S.I.*, No. 37, p. 37.

[3] Majumdar, N. G.: *M.A.S.I.*, No. 48, p. 53.

[4] *Ibid.*, p. 40.

[5] *Ibid.*, pp. 11-12.

[6] Marshall: *loc. cit.*, p. 513.

[7] Vats, M. S.: *loc. cit.*, pp. 414-15.

[8] Mackay: *Chanhu Daro Excavations*, p. 205.

Site V, layer 1

9 fragments of bangles of dark green glass with yellow surface decorations.
5 fragments of double chestnut brown and grey glass.
1 fragment with deep brown body and yellow surface decoration in the form of spots.
1 piece of wound four-tier bangle, comprising orange, yellow and green rings with yellow and green spotted decoration.

Site V, layer 5

1 piece of similarly multi-coloured wound bangle.
12 fragments of double chestnut brown and grey bangles as above.
4 pieces of green with yellow decoration as above.
3 pieces of burnt ochre coloured glass with yellow decoration.
1 half of child's bangle of similar glass.

Site I, layer 1

21 fragments of glass bangles, the main colours are plain green or blue-green glass, but fragments also occur of brown with yellow.

SHELL

A number of fragments of cut shank, probably from bangles or beads of this substance, were discovered. The only pieces which can be certainly identified as bangles come from the medieval settlement area, Site V. Of the other fragments none is from a layer certainly older than the early historic period.

BONE

A unique and interesting object from the Upper Neolithic, Site I, layer 7, is a worked bone point. It has been roughly cut to shape and then ground to a point, with diamond-shaped section and cut-away butt to facilitate hafting (Pl. 57*a*). Length 4·7 cm., breadth at base 1·65 cm., thickness 1·2 cm. It seems unlikely that this object would have formed the point of either an arrow or spear. Possibly it formed part of a shuttle.[1]

MISCELLANEOUS STONE OBJECTS

There remains to describe a single surface find from Area B, a stone disc, made of a very fine grained grey granite, mottled with pink, yellow and greenish tinges. The disc measured 6·75 cm. across and 1·8 cm. in thickness. It had evidently been used as an ear disc, or as a form for manufacturing ear discs with a lac filling inside a gold or silver plate. The upper surface was engraved with a typical lotus pattern in three bands around a central boss; the lower side has been hollowed out slightly. It is not hard to supply a date for the piece: the earlier excavations at Maski produced numerous similar discs of terracotta and even stone, and the 1954 excavations at the same site produced other examples. They cannot well be earlier than the early centuries of the Christian era, nor, indeed, are they likely to belong to a later date (Pl. 55, No. 4 and Pl. 56*a*, No. 1).

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[1] For what it is worth the comparable worked bone points of Shah Tepe may be noticed (Arne: *loc. cit.*, pp. 294-95 and Pl. LXXVIII). Bone points are found at several other sites in Iran, and nearer the Deccan at Damb Sadat and sites in the Quetta valley (Fairservis, W. A.: *Excavations in the Quetta Valley* (1956), Figs. 28-29). However, the closest related find is that of a worked bone chisel from the ash mound at Halakundi, Bellary district (Foote, *I.P.P.A.*, Pl. 46, No. 347).

9. HUMAN REMAINS

During the excavations three complete skeletons, one considerably crushed, were recovered as well as a fragment of human jaw. These have been described by Professor A. Ananthanarayana Ayer, Principal of the Stanley Medical College, Madras, whose report is attached as Appendix I of this volume (p. 143 below). The following field notes serve to introduce the archaeological contents of the specimens.

1. *Burial in Site VII, layer 11.*—The skeleton was of a young child. It was lying on the right side. The skull and other bones were badly crushed. The dentition was not recorded (*see* Pl. 19*a* and p. 23).

2. *Burial in Site VII, layer 6.*—The skeleton was of an adult lying extended upon its back, the head inclined to the right. The lower part of the skeleton was disturbed by local hooligans before excavation could be completed. The bones were in good condition. The skull was complete, being as far as the eye could judge mezocephalic and slightly prognathous. The lightness of muscular impressions, almost total absence of frontal ridge and general contour indicate, with what could be observed of the pelvis, that it belonged to a female. The sutures were all joined. The dentition was almost complete, the teeth were sound but heavily worn, indicating a diet including cereals ground in stone querns. The development of the other bones was robust (*see* Pl. 18 and p. 22).

3. *Burial in Site VIIIA, layer 4.*—This skeleton was also more or less complete, but it was much nearer the surface and the condition of many of the bones was fragile and they disintegrated easily. The skeleton was extended, lying on its back. The skull, after reconstruction, appeared to be mezocephalic and slightly prognathous. The muscular impressions were more marked than in the former case, so was the frontal ridge, and the general angularity of contour indicates that it belonged to a male. The dentition was well preserved but also fairly worn. The total height was probably slightly greater than the preceding example, well over 5 ft. 6 in. The bone development was similarly robust (*see* Pl. 22*a* and p. 24).

4. From Site VII, layer 3, came a single fragment of the right human mandible, containing first and second molar teeth. No other parts of skull or skeleton were recovered in the area. The teeth were heavily worn, suggesting greater age than in either of the preceding examples, and one was slightly decayed. This specimen is not described in Appendix I below.

SEROLOGICAL STUDY

The following report has been received from Mrs. Madeleine Smith of the Serological Laboratory of the British Museum (Natural History), to whom a single vertebra from the burial in Site VII, layer 6, was submitted. The report, although not as successful as had been hoped, is included because it points to the possibility of this type of serological determination, and emphasizes the need for larger samples (four or five vertebrae or the heads of several of the long bones would have been more likely to yield results), and for special care in the collection of samples. In future these should be taken from the soil without any chemical treatment (the sample here studied had been treated with polyvinyl acetate) and wrapped in sheets of polythene loosely closed at either end with elastic bands. Mrs. Smith writes :—

Cancellous tissue was removed from the body of the vertebra for use in these tests. There was some evidence of the presence of preservatives, but these were not thought to be present in such quantities as to make blood grouping impracticable.

Nitrogen estimation was carried out by Mr. G. C. Ross, in order to give some idea of the quantity of organic matter remaining in the bone. 0·73 mg. (0·02) per 100 mg. bone was found. This may be compared with determinations on recent material where an average of 5 mg. per 100 mg. is normal.

Inhibition tests were carried out with anti-A, anti-B, anti-H (Ulex Europaeus) and naturally occurring human anti-O sera. These were suitably diluted and applied direct to the bone sample.[1] A slight non-specific absorption was noted with the anti-A, anti-B, and anti-O sera. In view of the small quantity of organic matter remaining in the bone, it would not be feasible to connect this with the presence of any blood group substance. The age and the conditions of preservation of the sample have prevented a conclusive blood grouping. A variation in the conditions of preservation of material of similar age might give more encouraging results. It may be noted that Predynastic and Dynastic remains from Egypt have been satisfactorily grouped.[2] Further samples from this site and from others in India should be studied, in order to determine the possibilities of work with the blood groups in this area.

10. ANIMAL REMAINS

INVERTEBRATA

MOLLUSCA

Class: Gasteropoda

Order: Prosobranchiata

Sub-order: Monotocardia Section: Taenioglossa

Family: Cyclophoridae

From the Lower Neolithic levels of Site VII came a number of specimens of an as yet unidentified species of snail of the Cyclophoridae. The interest of these snails is that they are found in a forest environment, living on the bottom, never on trees, among dead leaves, moss and other low vegetation, preferably in dense forest. Their presence in this period and their apparent absence in all subsequent periods may thus indicate some environmental and climatic change (Pl. 57b, 2×*natural size*).

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[1] Smith, Madeleine: *Nature*, 184, 4690, pp. 867–9 (1959).

[2] Boyd, W. C., and Boyd, L. G.: *Immunol.*, 32, 4 (1937); and *ibid.*, *Am. J. Phys. Anthrop.*, 25, 3 (1939).

CLASS: PELECYPODA

Order: Eulamelliabranchia

Family: Unionidae

Several fragments of a freshwater mussel of uncertain species were obtained. They occurred in Site I in a level of the Iron Age or early historic period. Like the Chelonia plastrons below, they may be taken to indicate collection from a nearby riverine source, possibly for food.

VERTEBRATA

CLASS: REPTILIA

Order: Chelonia

Family: Trionychidae (soft tortoises)

Three fragments of the plastron of a soft tortoise (river or mud tortoise) of this family were found in a layer of the Upper Neolithic period (Site VII, layer 6); the animal cannot have been native to Piklihal but must have been brought from some nearby river, perhaps the Krishna.

CLASS: MAMMALIA

Order: Artiodactyla

Family: Bovidae

Sub-family: Bovinae

Bos indicus Linnaeus (Indian humped cattle)

Of more than one hundred and fifty identified bone specimens from the excavations four-fifths were those of this species. They appear in roughly equal numbers in the Lower and Upper Neolithic, in smaller numbers in the Iron Age and early historic levels (no doubt because of their very limited extent), and in larger quantities in the upper mixed layers. The bones resemble those of the modern cattle of the Deccan in every way, but as very few complete bones were available for study, and as no complete skulls or horns were found it is impossible to be certain of their precise affinities. One of the interesting facts emerging from the Neolithic levels is that many of the bones occurring in occupation debris have marks of being anciently cut, chopped and split, sometimes in such a way as to facilitate the extraction of the marrow. From this it may safely be inferred that the cattle formed an article of diet, apart from any other functions they may have filled.

1.	Upper molar tooth	VII	11
2.	Molar tooth	,,	10
3.	Part of head of femur	,,	10
4.	Lower molar tooth	,,	10
5.	Lower end of large metatarsal	,,	10
6.	Os coxa	,,	10
7.	Part of humerus	,,	10
8.	First and second phalanges	,,	10
9.	Ethmoid	,,	10
10.	Anterior portion of mandible	,,	10
11.	Upper molar tooth	,,	10
12.	Left fibular tarsal	,,	9
13.	Right radial carpal	,,	9
14.	First phalanx	,,	9
15.	Right fibular tarsal	,,	9
16.	Lower molar tooth	,,	9
17.	Incisor tooth	VIIIA	4
18.	Lower part of large metatarsal	,,	4
19.	Lower molar tooth	,,	4
20.	Left fibular tarsal	VII	9
21.	Dorsal vertebra	,,	9
22.	Cervical vertebra	,,	8
23.	First phalanx	,,	8
24.	Lower end of large metatarsal	,,	8
25.	Molar tooth	,,	8
26.	Left tibial tarsal	,,	8
27.	Occipital	,,	8
28.	Upper molar	,,	8
29.	Upper extremity of femur, head only	,,	7
30.	Lower end of large metatarsal	,,	7
31.	Internal lip of trochlea of femur	,,	7
32.	Two incisors	,,	7
33.	Right upper end of mandible	,,	7
34.	First phalanx	,,	7
35.	Second phalanx	,,	7
36.	Right intermediate carpal	,,	7
37.	Upper molar tooth	,,	7
38.	Lower end of right radius and ulna	,,	6
39.	Left maxilla	,,	6
40.	Molar tooth	,,	6
41.	Lower end of large metatarsal	,,	6
42.	Rib	VI	4
43.	Scapho-cuboid	,,	4
44.	Right fibular tarsal	,,	4
45.	Upper end of right radius	,,	4
46.	First and second phalanges	,,	4
47.	Molars, lower and upper	,,	4
48.	Parts of vertebra	,,	4
49.	Zygomatic process of squamous temporal	VIIIB	4
50.	Upper end of left radius	,,	4

51.	Lower end of left humerus	VIIIB	4
52.	Upper end of right radius	,,	4
53.	Right fibular tarsal	,,	4
54.	Large metacarpal	,,	4
55.	Part of head of femur	,,	4
56.	Large metatarsal	,,	4
57.	Upper end of right mandible	,,	4
58.	Large metacarpal bone	VII	5
59.	Left lower end of humerus	,,	5
60.	Right os coxa	,,	5
61.	Left upper end of radius	,,	5
62.	Left lower end of scapula	,,	5
63.	Left tibial tarsal	,,	5
64.	Upper end of right ulna	,,	5
65.	Second and third tarsals	,,	5
66.	Lower cheek tooth	,,	5
67.	Cervical vertebra	,,	5
68.	Maxilla	,,	5
69.	Part of vertebra	,,	5
70.	First phalanx	,,	5
71.	Upper molar tooth	,,	5
72.	Incisor tooth	,,	5
73.	Lower end of large metatarsal	,,	4
74.	First phalanges	,,	4
75.	Left radial carpal	,,	4
76.	Vertebra	VI	1
77.	Left rib	,,	1
78.	Lower end of left tibia	,,	1
79.	Left mandible	,,	1
80.	Os magnum, right	,,	1
81.	Upper end of left metatarsal	,,	1
82.	Lower molar	,,	1
83.	Mandible anterior part	,,	1
84.	Left lower end of humerus	VII	1
85.	Head of femur	,,	1
86.	Right condyle of tibia	,,	1
87.	Large metatarsal bone	,,	1
88.	Part of temporal fossa	,,	1
89.	Upper end of left ramus of mandible	,,	1
90.	Distal end of left humerus	,,	1
91.	Radial carpal, left	,,	1
92.	Lower molar tooth	,,	1
93.	Lower end of tibia	VIIIA	1
94.	Part of ilium	,,	1
95.	First phalanx	,,	1
96.	Rib	,,	1
97.	Part of head of humerus	,,	1
98.	Axis	,,	1
99.	Lumbar vertebra	VIIIB	1
100.	Lower end of right tibia	,,	1

101.	Molar tooth	VIIIB	1
102.	Left lower end of humerus	,,	2
103.	Lower end of large metatarsal	,,	2
104.	Lower end of scapula	,,	2
105.	Upper end of radius and ulna	VII	0
106.	Olecranon	,,	0
107.	Part of horizontal part of mandible	,,	0
108.	Lower molar teeth	,,	0
109.	Vertebra	,,	0
110.	Part of scapula	V	4
111.	Part of ribs	,,	4
112.	Large metatarsal	,,	4
113.	Upper molar	,,	1
114.	Os pedis	,,	1
115.	Os magnum, left	,,	1
116.	Lower end of large metatarsal	,,	1
117.	Upper left end of large metacarpal	,,	1
118.	Lower end of left tibia	,,	1

There is thus no direct evidence as to the horn type of these cattle. On the other hand there is indirect evidence. The terracotta figurines of the Lower and Upper Neolithic and the terracotta horns themselves indicate fairly lightly built long-horned cattle. The rock paintings and bruisings indicate several kinds, those which may be assigned to a medieval to modern date are clearly very much like the modern cattle of Bellary and Raichur, with their long swept back horns, but all the older paintings and bruisings, including some which may be confidently assigned to the Neolithic period, depict bulls with often very long horns, sweeping forwards. The animals are usually depicted as lightly built, but there are examples among the older specimens of very heavily built bulls. Thus it is not possible to agree fully with Mr. Thapar's conclusion that the cattle were mainly short-horned. There is absolutely no indication at Piklihal that this was the case. Mr. Thapar's argument is evidently based upon the close resemblance of the Maski specimens to the smaller, short-horned cattle of the Indus valley sites.[1] The indications of the Piklihal skeletal evidence, incomplete as it is, seem to favour comparison with the lightly built long-horned varieties which are still popular in the Deccan.

Bos bubalis Linnaeus (Indian buffalo)

The buffalo is to this day regarded in the Deccan as only half domesticated. Its relationship to the wild species is very close. The evidence of Piklihal is that only seven recognized bones occurred in the excavations, three in the medieval settlement area and the remaining specimens in the mixed upper layers datable to the early historic, early medieval and medieval periods. There is thus no evidence that the buffalo was domesticated here before early historic times, and more likely it did not become common at the site until medieval times. This

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[1] Thapar: *Ancient India*, No. 13, *loc. cit.*, pp. 13 and 125.

1.	Lower end of right scapula	VII	10
2.	Mandible	,,	8
3.	Part of rib	,,	7
4.	Tibia	,,	0
5.	Tibial tarsal	,,	0
6.	Lateral malleolus	,,	0
7.	Maxilla	,,	0
8.	Maxilla	,,	0
9.	Olecranon process	,,	1
10.	Large metatarsal bone	,,	1
11.	Piece of the distal end of the above	,,	1
12.	Vertebra	,,	1
13.	Lower end of the tibia	,,	1
14.	Right lower end of tibia	,,	5
15.	Molar tooth	,,	1
16.	Piece of lower jaw	,,	7
17.	Lower jaw	,,	4
18.	Os pedis	,,	9
19.	Large metatarsal	,,	5
20.	Olecranon	,,	5
21.	Lower jaw	VI	4
22.	Scapho-cuboid	,,	4
23.	Large metacarpal	V	4
24.	Second phalanx	,,	4
25.	Left large metacarpal	,,	4

Order: Carnivora

Family: Canidae

A single occurrence of a bone identified as that of a carnivore was noted in a level dating to the early Iron Age. More precise identification of species was not possible.

1.	Canine tooth	VII	5

Order: Proboscidea

Family: Elephantidae

Sub-family: Elephantinae

Elephas maximus (the Indian elephant)

A single specimen occurred in an early level of Site VI assignable to the end of the Upper Neolithic or beginning of the Iron Age. It was apparently identical with the modern species. One is reminded of the Maski seal representation of an elephant.[1]

1.	Metacarpal	VI	4

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[1] Piggott, S.: *Antiquity*, XVIII (1944).

11. CHARCOAL SAMPLES

A number of charcoal samples from the Lower Neolithic levels have been submitted for expert examination and the report upon them is still awaited. A single sample was examined by Dr. A. Chalk of the Imperial Forestry Institute, Oxford, and identified as a *Terminalia tomentosa.* This specimen came from Site VII, layer 10.

12. SAMPLES FOR C14 DATING

A number of bone samples were submitted to the C14 laboratory of the British Museum. However, none of these specimens produced sufficient carbon to make possible a dating. At the same time a charcoal sample from a low level of the Utnur ash mound, excavated in 1957, from a cultural period corresponding to the Lower Neolithic of Piklihal, gave a date of 4120 ± 150 years before present time. It will be seen that this date accords reasonably well with the absolute date proposed for this period on the basis of cross-datings with Iran (below p. 129).

PART III

INTERPRETATION, CHRONOLOGY AND CONCLUSION

INTERPRETATION OF STRATA

We may now attempt to interpret the evidence and to reconstruct some sort of picture of the life of the people who lived at Piklihal. First we must consider the culture sequence, its regional and wider affinities and the evidence they afford for arriving at an absolute chronology.

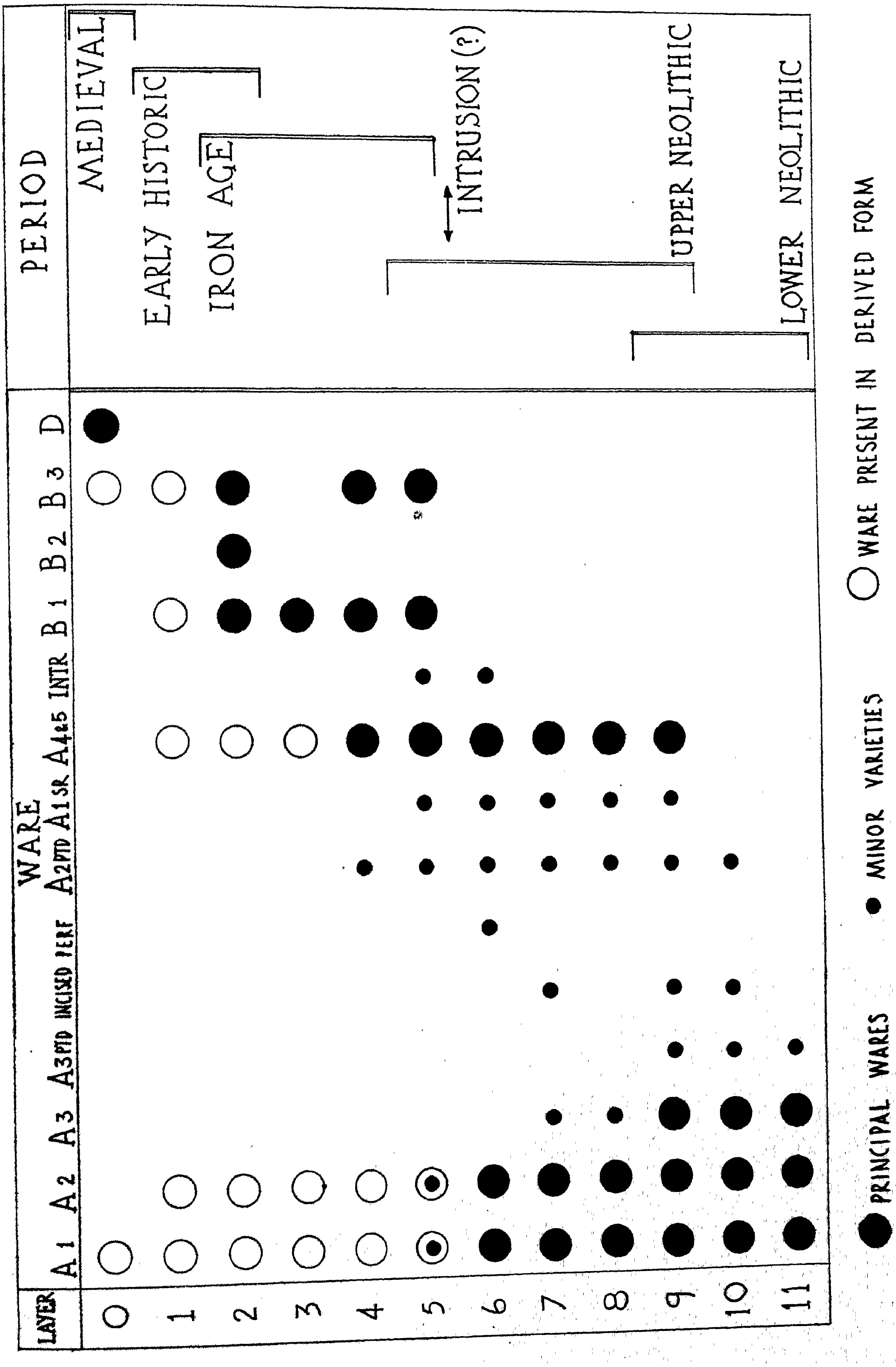
A study of the pottery from *Site VII* shows that certain wares occur for the first time at certain levels. From this, using as a basis the technological and morphological analysis of the pottery, we may discern a certain pattern which can be expressed thus:

Lower Neolithic: A1, A2, A3, A3 painted wares.

Upper Neolithic: A1, A2, A4, A5, A2 painted, A1 rusticated wares.

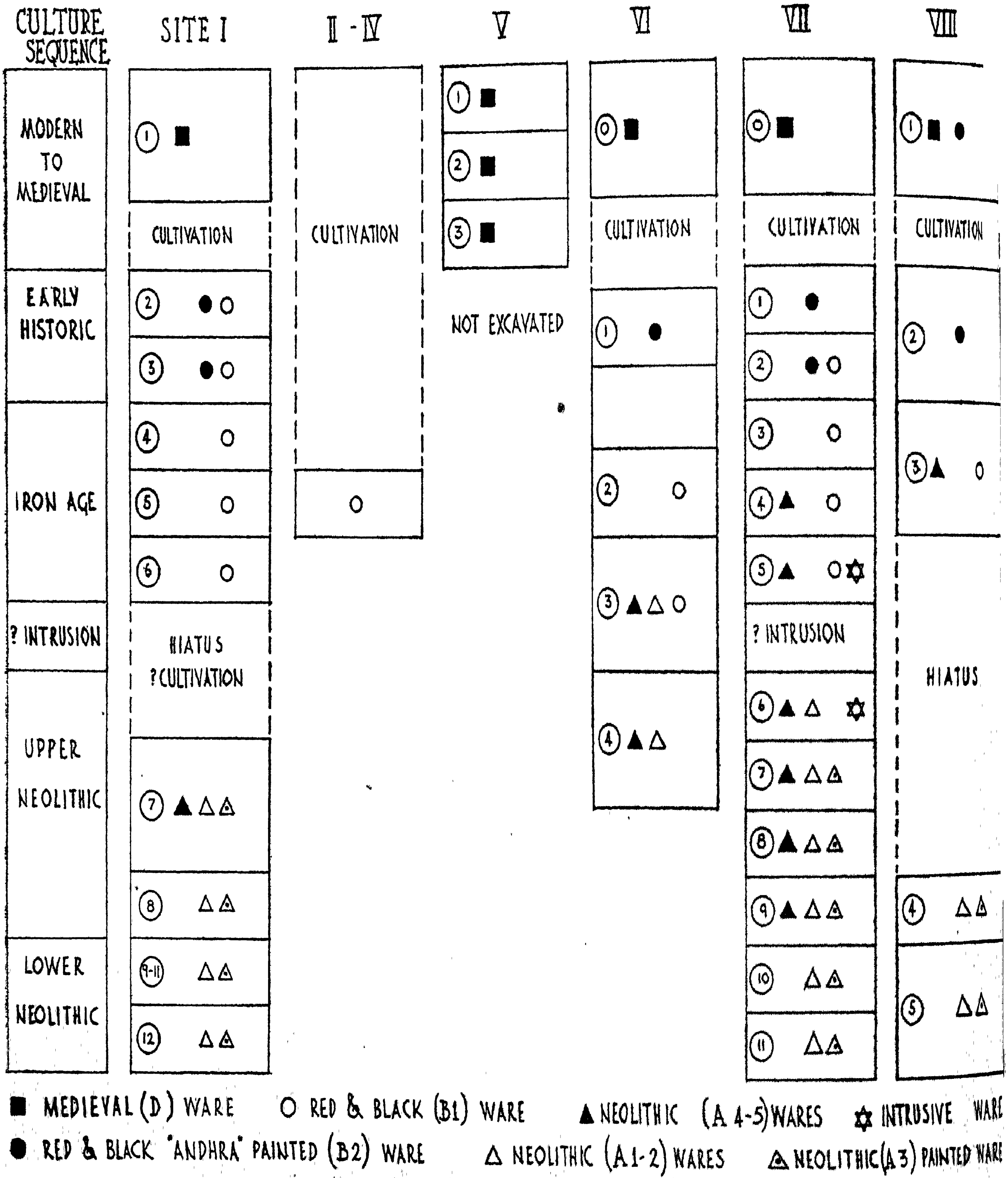
Thus it appears that on the basis of pottery wares (and incidentally of forms) alone the Lower and Upper Neolithic periods can be differentiated. We have already discussed the suggestion of some sort of intrusion which, at the end of the Upper Neolithic, heralds the Iron Age. The Iron Age brings with it two new wares, the red-and-black B1 and B3. These appear at first alongside the A wares but in the upper levels they come to dominate while the A ware is present only in derived form. Finally a single layer in Site VII contains, alongside B1 and B3 ware, the B2 painted which we follow Wheeler in regarding as the hallmark of the early historic period in this region. Only in the surface layer, along with quantities of derived pottery of the earlier periods, do we find the distinctive D ware of the medieval period (*see* Pl. 58).

Using the occurrence of wares at Site VII as a basis for determining the periods of occupation represented at the other sites we find the result illustrated in Pl. 59; *Site I* contains typical deposits of the Lower Neolithic, Upper Neolithic, Iron Age, early historic and medieval periods in proportions differing from those of Site VII mainly in the complete break between layers 6 and 7. This break must indicate a hiatus while the area was abandoned or cultivated. In *Sites II to IV* no cultural remains were found except those of the Iron Age. The fields are at present under cultivation and may well have lain as waste areas before they came to be cultivated. *Site V* was not completely excavated. It contained exclusively debris from the medieval period and well accords with its position inside the medieval fortified area. *Site VI* is in many ways problematic. Its surface contained debris of the medieval period but beneath there were washed layers which, even so, were amenable to some periodization. The upper layer belongs to the early historic and the lower three layers to the Iron Age and Upper Neolithic. There is a suggestion that these layers straddle the intrusion and represent a period of overlap. In *Site VIIIA* the sequence is most compressed.



Stratigraphic chart showing occurrence of various pottery wares in Site VII

PLATE 59



Comparative stratigraphy of Sites I–VIII showing occurrence of key pottery wares and comparative periods of occupation, etc.

Single layers represent the medieval, early historic and Iron Age periods. There is then a well-marked hiatus and below are deposits comparable to the Lower Neolithic of Site VII. *Site VIIIB* has not been indicated for the reasons already stated.

SEQUENCE CHRONOLOGY

REGIONAL

We may now establish the relationship between the Piklihal sequence and that of other excavations in the north Karnataka or central Deccan region; after this we shall consider its external relationships. While almost all the excavations from the former region have been published, reports upon many of the most important from other parts of India are still awaited. Thus the former part of our task is much easier than the latter.

The sequence at Piklihal compares closely with that of Brahmagiri.[1] In spite of the apparent divergence in descriptive terms there seems to be an overall comparison of the Brahmagiri IA and IB periods with the Lower and Upper Neolithic of Piklihal. There is a close relationship of pottery forms and wares, from both periods. It is perplexing that at Brahmagiri, where surface finds of the intrusive AB wares are far more common than at any other site I have visited, no evidence of them was recorded in the sections. However, the pottery pit, or rather slab lined grave, seems to fix the position of the intrusion quite certainly, and thus we may interpolate it on to the Brahmagiri sequence. The Megalithic period shows a close overlap of pottery types with the Piklihal Iron Age, as does the Andhra period with the Piklihal early historic. However, some slight adjustment may here be necessary as some pot forms from the Brahmagiri Andhra period appear to belong rather to the Piklihal early medieval, suggesting a somewhat longer occupation of parts of the site than its excavator allowed. There is a similarly close correspondence of periods at Sanganakal.[2] The Phase I, pre-Neolithic or Late Stone Age is not represented at Piklihal. Phase II, sub-periods 1 and 2, correspond closely to the Piklihal Lower and Upper Neolithic. The Intrusion is certainly represented by surface finds of AB painted ware and even perhaps by a single sherd from trench II. Once again we may interpolate this evidence on to the published sequence. The Phase III appears to correspond with at least the earliest portions of the Iron Age, but seems to show that the site was abandoned well before the early historic period. In all these sites, then, there is some indication of an intrusion of AB ware. This must have been of very short duration for it hardly, if at all, appears in the sections, and may well be taken to indicate a short-lived period when new elements of population arrived from the north, very soon to become absorbed, either into the existing population or by further waves from the north. In the latter case these further waves would have been those of iron users who established the dominance of the B1 red-and-black ware. The sequence at Maski is basically similar.[3] There is very little evidence of distinctly Lower Neolithic remains from the excavations and it seems that the period is represented by a few pits in the bottom of the main section. The Upper Neolithic is well represented as is the Iron Age (Period II), from which a whole series of valuable burial groups are recorded. Period III closely corresponds to the Piklihal early historic, and Period IV to Piklihal medieval. The early medieval period once again is not represented. We may express these correspondences thus:

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[1] *Ancient India*, No. 4, *loc. cit.*

[2] Subbarao, B.: *Stone Age Cultures of Bellary* (Poona, 1949).

[3] *Ancient India*, No. 13, *loc. cit.*

Piklihal 1952	Brahmagiri 1947	Sanganakal 1948	Maski 1954
Medieval	—	—	IV
Early medieval	—	—	—
Early historic	Andhra	—	III
Iron Age	II	III	II
Intrusion	(pottery group B)	(surface AB)	
Upper Neolithic	IB	II.2	I
Lower Neolithic	IA	II.1	—
—	—	I	—

COMPARATIVE: NEOLITHIC

The wider comparisons of the sequence of the Karnataka region are important not only because they lead towards an understanding of the cultural genesis but also because they lead towards areas where there is hope of obtaining firmer cross-datings and ultimately absolute dates. In so far as the scanty information from areas south and east of Piklihal is likely in the end to show no more than the final extensions and developments of the Deccan Neolithic, we shall not consider them here. For comparative materials, broadly, four further areas present themselves: Maharashtra and Malwa, Saurashtra, the Indus valley and Baluchistan, and the Iranian plateau. We shall consider them one by one.

Maharashtra and Malwa.—It seems probable that, when even the work so far carried out in Maharashtra is fully published, there will be found to exist there a closely parallel sequence to that of the Karnatak region. However, much has yet to be published and the possible comparison is less firm than it will no doubt become; but we can already make certain valid comparisons. So far nothing has been reported which can be specifically linked with the few pottery forms which appear at Piklihal in the Lower Neolithic only; of those which occur in both Upper and Lower Neolithic about ten are found also at Jorwe; while of the Upper Neolithic forms about a dozen are found at Jorwe. From Nasik the few reported forms of Period I are all to be equated with the Upper Neolithic. At both these sites, and at Prakash and Bahal, there are significant affinities of ware and potting technique. This is particularly marked in the case of the hand-made grey wares, less so with the wheel-thrown painted wares. At both Prakash and Bahal such peculiarities as the A2 grey, ochre painted, wares, are reported; and at both sites the grey wares provide numbers of close analogies with forms of the Karnataka A2 ware. Using these similarities we may make the tentative equation: Piklihal Upper Neolithic = Bahal IA, Jorwe I, Prakash I, Nasik I. Piklihal Lower Neolithic may also equate with the earlier phase of Prakash I, and perhaps part of Bahal IA. There is not yet any material published from Malwa which can be related to the Deccan Neolithic, in anything more than the most general terms.

Saurashtra.—Too much uncertainty surrounds the earlier excavations at Rangpur, and the recent work there has not yet been sufficiently published to provide material for comparison. At Lothal, whatever the interpretation of the finds, there is apparently pottery of—at least—two distinct traditions. These are a potting industry closely linked by its techniques and products to that of the Indus civilization; and a second industry, apparently running side by side with the first throughout the levels of the site, producing hand-made, turn-table built, products, burnished and unburnished grey and buff wares, red to brown ochre dressed and burnished wares all equating with the A1, A2 and A3 wares of the Deccan. There is also, in this second industry, a sprinkling of sherds of A4-5 types, dressed and burnished and throwing up the occasional red-and-black sherd in much the same way as during the Neolithic at Piklihal.[1] The further sequence of the region is revealed at Somnath (Prabhas Patan), but the comparisons with the Deccan Neolithic appear, at first sight, to be less marked.

Indus valley.—The Indus civilization presents striking affinities and equally striking contrasts with the Deccan Neolithic culture. We have already noticed some affinities; for example, the Neolithic blade industry of both cultures belongs to a great complex of such industries which, because of its breadth, affords little if any clue to the nature of the culture contact involved. Many of the ground and pecked tools, such as the saddle querns, are also related in a remote way. The advanced metallurgy of the Indus sites can find parallel tool types to those from sites of the Neolithic-Chalcolithic complex of the peninsula, including the Piklihal copper chisel, even though the technology of the cities was far more developed than that of the outlying settlements. However, it is quite possible that the types survived in the Deccan for centuries after the extinction of the Indus cities. The potting tradition of the Indus is in striking contrast to that of the Deccan Neolithic. The uniform wheel-throwing and firing is essentially different from the burnished hand-made or turn-table made wares, fired on simple bonfire kilns. The range of forms varies as a function of the techniques. Even when common types occur, as for example the offering stand, they are so remotely related as to show little evidence of contacts. Again, the perforated bowls of the Deccan are unlike the Indus culture perforated braziers. The spout is almost unknown in the Indus before Jhukar times. Among terracottas from the Indus very few can be compared with those of the Deccan. However, at both Harappa and Chanhu Daro we have noticed examples which can claim to be identities, and these would seem to afford the first firm evidence of cross-dating. Further evidence is supplied by the steatite paste disc beads. These are common at all Indus sites, particularly in the middle and upper levels, and Mackay has recorded a shop at Chanhu Daro where they were actually made. The earliest Neolithic occurrences at Maski and Piklihal, or at Bahal, would seem to be evidence of export and trade contact. Finally, the important place of the *bos indicus* in the life and economy of both cultures is well attested. This provides some general indication of culture contact.

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[1] These observations are based upon notes which I made when I visited an exhibition of finds from the excavations at Lothal in October, 1957, at Ahmedabad.

Iranian plateau.—Beyond the Indus valley, in the tangled valleys of Baluchistan and among the no less tangled remains of its archaeological culture sequence, we largely lose trace of distinctive culture traits associable with the Deccan Neolithic. This does not necessarily mean that such traits are not to be found there, and certain ranges of objects, such as the terracotta bulls of Mehi or Kulli, are highly suggestive that they may yet be. Other traits cannot be taken as evidence: for example, the disc beads, reported there, may also be regarded as exports from the Indus valley; while certain techniques, such as the surface roughening of pottery, are also common to the Indus valley and Baluchistan (for example in the Quetta wet ware of Fairservis, or the granulated ware from Miss de Cardi's recent work at Anjira (III-IV)).[1] In these circumstances of uncertainty it is all the more surprising that we should discover cultures which show important ranges of affinities in such a remote area as N.E. Iran and Turkistan. That we do so seems now established. The most prominent indication of the affinity lies in the potting tradition. The pottery with which we are concerned belongs to an infiltration of grey ware often thought to be associated with folk movements from the Turkoman steppe.[2] The grey ware has been reported at sites such as Hissar, Turang Tepe, Shah Tepe and Namazga. There are other sites in Dagestan and in Iran itself which produce allied wares, although much may be later, for the grey wares persisted for many centuries. However, it appears that the whole grey ware complex had its early focal point in the mountain ranges running westwards from the Elburz to Anatolia, and perhaps it developed there. If so the earliest evidence would be from the western limits, for example in the Chalcolithic at Alishar (first half of third millennium B.C.), and its first appearance in the eastern extremities may be dated slightly later, appearing for example in Hissar IIA by about 2500 B.C. Across the whole mountain area a sequence of certain key forms has emerged which makes possible the correlation of Hissar with the better dated sites of the west.

It has long been felt that the appearance of these grey wares in Iran, and even in Northern Iraq, heralded the arrival of some new, nomadic peoples, pastoral barbarians who spread from the north. Thus Professor Mallowan noticed, in the excavations at Chagar Bazar on the Khabur, that a similar intrusion of grey wares took place.[1] Later in describing the excavations at the neighbouring Brak he again noticed the phenomenon and commented on it at some length. The pottery was found throughout the middle of the third millennium, it was generally black to grey surfaced, unpainted and hand-made, it replaced the earlier wheel-thrown pottery at those sites. Commenting on the curious and limited range of forms, Mallowan suggested that they imitate the forms of leather bags or pouches, the sort of luggage that would be favoured by pastoral nomads.[2] The grey wares seem also to have spread into Baluchistan, probably from the north and west, for they appear in Late Harappan contexts in sites in the Quetta-Kalat area.[3] We have already shown that the potting tradition represented at Shah Tepe (and no less at the other sites) suggests parallels of technique and to a certain extent even of form with those of Piklihal. On the strength of this relationship we have proposed that the latter industry must represent some sort of culture contact, however remote, dating from the end of the third millennium. We have also noticed in discussing the other industries of the Deccan Neolithic that some such relationship is by no means impossible.

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[1] De Cardi, B.: *Antiquity*, XXXIII (1959), pp. 15–24, 'New wares and fresh problems from Baluchistan'; I am also grateful to Miss de Cardi for showing me specimens of the pottery from this site.

[2] *See*, for example, Arne, *loc. cit.*, p. 112; Ghirshman, R., *Iran*, p. 70, etc.

Thus we may reach certain conclusions regarding the genesis of our Deccan Neolithic culture and the date of its origin. In northern Karnataka and in Maharashtra there is a common stratum which seems to bear evidence of a movement of the first settlers into the former. From Lothal there is a suggestion of closely related pottery existing side by side with the later phases of the Indus civilization. There are several suggestions of trade or movement which support this association: among them the disc beads, the forms of the earliest copper tools of the Deccan, and the typical terracotta bulls of the Lower Neolithic. All these carry with them a suggestion that the culture was either already seated in the Deccan during the period when the Harappan culture flourished, or at least passed through areas where that culture was flourishing or had very recently flourished. Finally we have found that the affinities of the potter's craft to that of N.E. Iran during the last centuries of the third millennium suggest a source for the culture and an upper dating limit for its breaking away from that region, while there are indications that the new spread of grey wares was felt in northern (if not also southern) Baluchistan in late Harappan times. These considerations would seem to indicate outside dates of 2600–1700 for the movement of the culture, but certain minor indications suggest that the former date may be nearer to 2100 B.C. Thereafter, it is reasonable to allow a period to elapse before the final diffusion into the Deccan.

INTRUSION

The date of the intrusion which brings to an end the Neolithic period in the Deccan presents the next problem. We have already noticed the probably short duration of our Upper Neolithic as a period when contacts with the north were already introducing new elements. What these elements were may be gauged from the finds of Bahal and Jorwe. This period terminated in the introduction of new culture traits including red-and-black ware. Thus, while we have a probable synchronism at both Bahal and Piklihal of the Upper Neolithic (IB) terminating in an intrusion, the date of the intrusion must depend upon the whole complex of red-and-black ware sites now being revealed. It has long been accepted that the ware occurred throughout the peninsular graves in a closely related range of forms. Now the presence of red-and-black ware at such sites as Nasik, Bahal, Ahar and Maheshwar suggests the direction from which it came. Likewise its spread at an early date eastwards is attested at such sites as Rajgir and Sonepur (district Gaya), where its first occurrence is in layers which antedate the N.B.P. or at least coincide with its first occurrence. It is likely that the scratched ownership marks will provide a useful pointer to the early centres where the red-and-black ware developed, for they are found at Bahal in what must be an early context. It is probable, although the evidence is not yet available, that the intrusion represents the spread of the first iron using peoples into the Deccan, and the exact determination of this date will obviously be of great interest. There also seems to be evidence for a division of the red-and-black wares, having regard to form, into an early (represented by that of Bahal IB, etc.) and later (represented by Nasik Period II). While the focal point for the early development and spread of the red-and-black ware throughout India remains uncertain, it can be provisionally proposed that it should be in Sind, Saurashtra and Rajputana. The date of the expansion on the other hand may perhaps be more clearly defined with reference to the intrusive AB ware. Even on the very slender evidence available it can be seen that the distinctive wheel-thrown rims and forms belong to a complex which has its parallels, no matter how remotely, in the Necropolis B of Sialk and in the cairn burial sites of Baluchistan, for example Jiwanri.[1] We have little difficulty in accepting Gordon's proposed dates for the movement into Baluchistan of these cairn builders (following 850 B.C.);[2] and, allowing a sufficient margin for their settling in the regions indicated and then once again expanding, we may reach a date in the sixth to seventh century B.C. for their expansion into the Deccan, and for the Iron Age which must soon have followed.

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[1] Mallowan, M. E. L.: Excavations at Tall Chagar Bazar, *Iraq*, IV, pp. 105-6.

[2] Mallowan, M. E. L.: Excavations at Brak and Chagar Bazar, *Iraq*, IX (1947), pp. 29-30.

[3] Information from Miss B. de Cardi, whose recent work in Kalat has made an important contribution to our knowledge of that area.

LATER PERIODS

There is, as we have seen, no inscriptional or coin evidence for the dating of the remaining three periods. As all relate to historical times and as it is only a matter of further research before the exact dating becomes apparent, we may here indicate very briefly the absolute dates which seem to apply. The early historic period in Piklihal is obviously very closely related in time to Wheeler's southern site at Arikamedu, but as many of the pottery forms of the Arretine levels of the northern site are identical it seems probable that the beginning of the period may be dated to about the beginning of the Christian era. The end of the period may be probably gauged with reference to the break up of the Satavahanas and thus assigned to the middle of the third century A.D. The early medieval period, which from the point of view of pottery and material remains represents a sort of declining prolongation of the early historic, may be assigned to the lengthy interval from that date until the onset of the Muslim invasions of the Deccan, or rather, in the absence of any sort of firm evidence, until the end of the first millennium.

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[1] Stein, Sir M. A.: *M.A.S.I.*, 43, Pls. VIII-IX.

[2] Gordon, D. H.: *Ancient India*, Nos. 10 and 11, p. 174.

ABSOLUTE CHRONOLOGY

We must again notice that there is at Piklihal nothing which can supply any absolute dating evidence for any of our periods.[1] At Brahmagiri and Chandravalli rouletted ware provided a cross-date to Arikamedu with its imported Arretine ware. At Chandravalli coin evidence threw further light upon the early historic (Andhra) period. At Sanganakal, as at these two sites, no certain cross-dating evidence was available for the Neolithic and Iron Age periods. In the recent (1954) excavations at Maski dating evidence was only available for the medieval period, otherwise no more precise material is available for the earlier periods. In these circumstances each new excavation has lent weight to the general sequence but added little to the absolute dating. Thus anything we may add will be rather in the form of new speculation than fact, and to argue about small details will be no more than splitting hairs. In proposing the following dates for the later periods we are influenced by a variety of field observations at other sites in the Raichur Doab. The statement of this evidence, however, must await a future publication. Baldly stated the dating points in the sequence are as follows:

Lower Neolithic	*c.* 2000 B.C.–*c.* 1250 B.C.
Upper Neolithic	*c.* 1250 B.C.–*c.* 650 B.C.
Intrusion	*c.* 650 B.C.–*c.* 550 B.C.
Iron Age	*c.* 550 B.C.–1st century B.C.
Early historic	1st century A.D.–*c.* 300 A.D.
Early medieval	*c.* 300 A.D.–*c.* 1000 A.D.
Medieval	*c.* 1000 A.D.–

CULTURAL INTERPRETATION

LOWER NEOLITHIC

Sifting the fragments of evidence we have collected and piecing them together in a new order we begin to see the dynamic result of our study. The earliest human settlement of which we have found evidence at Piklihal is that of the Lower Neolithic period. Here, as elsewhere in the region, to understand the life of this period it is necessary to consider it in the natural setting; for this reason we have discussed the modern aspect in some detail (above pp. 1-2). Not only is there a suggestion that the rainfall was higher at the commencement of the period, which in itself would bring about some increase in the natural growth, but it is probable that the uninhabited hills of Piklihal were covered with a thicker vegetation before man set about clearing their tops and his domesticated beasts began devouring it. Thus the *cyclophorus* snail disappears after the very earliest settlement. At present the hills of the forested parts of the area are covered by sparse scrub, the plains by similar scrub and grass. It may be inferred from the vegetation of the successively rising rainfall belts to the west of Raichur, towards the ghats, that if there were an increase in rainfall in these parts of the Deccan the higher rainfall belts would move farther east, bringing to Piklihal deciduous forests at present found only many miles to the west.

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[1] This was written before the C14 dating from the Utnur ash mound was available. The dates which we here proposed depended largely upon the various tenuous cross-datings mentioned above. As we have noted (p. 121) the Utnur date nicely reinforces these inferences.

The earliest settlements must have involved making clearings upon the level spaces on the tops, sides or feet of the little granite hills. Probably, as at Site VII, a natural cave or rock shelter was an added attraction, and a family group would camp outside it, enlarging the natural rock platform by an artificial one of small boulders (pp. 22-23). There is no evidence of any permanent houses at this time, either here or at other excavated sites. It may be presumed that the clearing of the natural plateaux and the construction of the rocky platforms would lead naturally towards the great characteristic of Neolithic sites, the terracing or 'linchet' systems, as Foote inaccurately called them; although the first exact evidence for such terraces at Piklihal apparently belongs to the Upper Neolithic. However, as I hope to show in a later volume, at site after site the Neolithic settlements are found to coincide with these terrace complexes, and thus it seems safe to see their origins with the origins of the culture itself. At Piklihal there are traces of terraces having once existed on small flat areas on the very hill-tops, now quite eroded; similarly there are many small terraces in lower saddles (for example Site VI); while the broad cultivated spaces of Areas A, B and C all bear evidence to having accumulated upon comparatively rocky ground with originally only a thin humus between the great boulders. Thus the Neolithic settlement may be seen as the beginning of a process of accumulation of soil connected in part with stone retaining walls. It is probable that the terraces served three main functions, habitation, cattle penning, and cultivation. At Piklihal, as elsewhere, tiny fields are to this day cultivated, often at considerable heights above the plain, on terraces which bear traces of Neolithic occupation. Their continued cultivation implies the maintenance of the stone revetted walls which divide each terrace from the lower ground. The pursuance of this activity may well be a direct survival of a practice which originated in Neolithic times (Pl. 7).

We turn now to the life of these early Neolithic settlers. It is clear that their appearance in the Deccan must have been the result of a movement, as there is no known social group or culture which could at this time have provided, locally, a suitable medium for development. What the movement entailed, where it came from and the affinities of our culture to those outside the Deccan we shall discuss below. Here it suffices to note that at the time when the Neolithic culture was flourishing in the region it was the most advanced way of life in the area, contrasting as markedly with that of the Late Stone Age hunting tribes scattered over the peninsula, as do the Todas with the Kadar of Cochin. Thus we may regard it as *primary* in the region, however much in the wider context it was derived from areas in which Neolithic or Chalcolithic cultures were in existence at an earlier date.

We must remember that the material remains which survive are only those which can withstand the ravages of time, and thus the evidence for less durable crafts is often very slight, if it exists at all. The people brought with them an already fully evolved Neolithic stone industry. The most common tool was the axe, flaked from basalt or other rock and with at least the edge ground (Pls. 43, 44). Less common were small tools almost certainly hafted and used as adzes; and small chisels, either used in the hand or hafted. One of the chief uses of the axes must have been to bring down leaves from bushes and trees for the animals to eat, but the more carefully finished would provide fine woodworking tools, and there can be little doubt that a whole range of wooden objects was made of which no trace has survived. The use of fire, incidentally, is attested by the common charcoal deposits in the period. Beside the axes there was a whole series of other stone tools finished with either pecking or grinding. These included concave querns and several types of rubbing stones, palettes—perhaps for powders, hammers and pounders (Pls. 45–49). Tools are also found which were probably used in the manufacture of axes. A second stone-working tradition was a Neolithic blade industry employing techniques and producing a range of tools basically similar to those of this industry wherever it has been recorded in Neolithic and Chalcolithic sites of the Middle East and Iran no less than in the Indus valley or elsewhere in western India. The working techniques involved important mass production principles which made possible the rapid manufacture of numbers of small tools of standard size and form (Pls. 51–54). These tiny blades could be used in two ways, either blunted or retouched to form points or barbs for composite arrows or harpoons, or even tiny awls, or small penknife-like blades for a multiplicity of domestic uses; or many could be mounted together in a composite haft of wood or bone, in a gummy matrix, so as to make knives or sickles. There is no evidence for the use of any metals during this period of the Neolithic: this agrees with the evidence of Sanganakal and Brahmagiri and indicates its truly Neolithic character. There is, however, no reason to suppose that copper and bronze were totally unknown. The potter's craft was also well developed. Although there is no evidence for the use of the potter's wheel, yet the techniques of manufacture were far from crude and the standard of the pottery was remarkably high (Pls. 24–29 and 33-34). In the absence of the wheel the contrast with the pottery of the Indus Valley Civilization and of Chalcolithic sites of Baluchistan is perhaps more important than any superficial resemblances. The majority of pots were made not by hand alone but with the help of a turn-table, and there is evidence that the potter's dabber, characteristic of so much Indian potter's work, was already in use. Although the majority of the pottery was plain buff or grey burnished ware, a small proportion of pieces were coated with a bright red, brown ochre or black dressing, probably in all cases made from ground-up ochre, and some of these dressed vessels were further painted with black to purple manganese designs. We have tried to rediscover domestic and special functions for which such a wide range of forms was made, and seen that it includes cookery and storage, as well as service and eating of foods. Among the special forms one of the most interesting is that of the unique legged offering stands in A3 red ware, and it is presumed that these had some special religious or ritual significance (Pls. 33, 34). It is probable, although as yet it cannot be proven, that the basket making, mat making and bone working, which are all attested by very rare specimens either undated or dating from the Upper Neolithic period, came into use during the Lower Neolithic, but for one reason or another evidence for them has disappeared.

We have now seen what was the material equipment of these people, but we have not yet discussed the evidence which entitles us to regard them as truly Neolithic in the sense of being food producers. We must now consider their subsistence and economy. There is much evidence which clearly indicates its pastoral character. Three domestic species are attested: the Indian humped cattle, the sheep and the goat. The bones of the former, from the habitation deposits, are by far the most numerous and alone would indicate the importance of cattle. They are mainly small fragments which often show marks of cutting or chopping. Thus it seems certain that beef formed a main part of the Neolithic diet. But there is other evidence which would support our contention that cattle were the mainstay of the economy. Many pots appear to have been made for use in connection with milking and milk preparation; terracotta figurines, probably with religious significance, were made of the special A3 red ware (Pl. 41*a*); while we have seen that the rocks around the settlement carry many paintings and bruisings of cattle, suggesting a tradition which goes back to this time (Pls. 1 and 13). Finally the presence at Piklihal of an ash mound, which in the light of our excavations at Utnur in 1957 can now be seen as a Neolithic cattle-pen, probably linked with seasonal bonfires and pastoral religious rites, adds yet another indication of the pastoral nature of the economy. There is at present no evidence of what, if any, plants were cultivated, but there are several indications that small scale horticulture, rather than agriculture, was practised. The little terrace complexes would provide easily worked gardens, probably to be preferred to fields cleared by slash and burn upon the heavy black cotton soil. The large numbers of querns and rubbing stones suggest that some cereals were utilized. That the querns were used in the preparation of food can probably be inferred from the highly worn condition of the teeth of skeletons from Sites VII and VIII. Again the probable use as sickles of the many uniformly sized small blades, which have never been blunted on the back and are thus not suited to manual use, may suggest the harvesting of some cereal, although the manual plucking of millet could well have dispensed with this function (for example Pl. 51, No. 20). If this is so then it may be inferred from the geographical and climatic environment that the plant grown would be some sort of millet. Finally, it may be supposed that the food thus produced would be augmented both by collected forest produce and by animals shot with the bow or trapped. These may have included the wild buffalo, varieties of deer and gazelles, etc., for all of these are found in rock paintings or bruisings.

There is some slight indication that small scale trade, or exchange, may have been carried on. We have noticed that the raw material for the stone blades was often brought from distant localities, and that some of the axes, rubbers and grinders are of stones which appear to have been produced at one factory and traded over considerable distances. Another possible indication of trade is found in the clear evidence of great axe factories at such sites as Billamrayan Gudda or Kupgal. At Piklihal there is very little evidence of the large scale manufacture of axes. Thus, while it may be that the raw materials for these various tools was obtained by foraging parties the possibility cannot be overlooked that there was already some small scale barter or exchange in existence. Nor can the interesting possibility be quite ruled out that cattle themselves may have been bred in the region and taken away for sale elsewhere.

We have already noticed the main types of artistic expression which have survived, the painted pottery, the terracotta figurines of cattle, birds and men, and the great series of rock bruisings and paintings leading us back inescapably to this period. It is probable that many more transient forms of art have disappeared leaving no traces. Many if not all of the examples which we have noticed may be taken to represent magical or religious expressions rather than strictly artistic. There are several things which seem to point to magical practices and religious beliefs. We noticed the presence of certain caves and shelters, remote from the settlements, covered with painted signs and marks (Pl. 10*b*). In one case a modern shrine still exists nearby. The bruised and painted bulls, men, and other scenes, the ash mounds, and the offering stands all seem to belong to a complex of pastoral and agricultural rites of a kind very widely recorded among early farming communities. Finally, the habit of putting grave goods in burials indicates some sort or belief in a future life. Of the three burials found, one is from the Upper Neolithic, but it seems to belong essentially to the series and so we may treat the evidence it provides as part of Neolithic burial custom. In each case the body was buried in a shallow pit in extended position. In the case of the adult male burial stone axes were placed by the feet, a small bowl near the loins and five long blades by the side of the head (Pl. 22). There is a suggestion that these latter were tucked into some head-dress which the deceased wore, in much the same way as the modern *pagrī* is used to hold flint, tinder and other possessions. Above the body in the grave a bovine scapula may also represent food for the deceased. The female skeleton had a large spouted pot by her head (a similar feature was recorded at Brahmagiri),[1] and a deep (?) milking bowl by her loins (Pl. 18*b*). All these burials seem to have been near to, if not actually within the living areas. No examples of infant urn burials of the type so common in the IB (Upper Neolithic) phase at Brahmagiri were found, and it is thus not possible to say whether they are peculiar to the Upper Neolithic or appeared also in the Lower.

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[1] *Ancient India*, No. 4, *loc. cit.*, Fig. 21, No. T46, p. 229.

Finally, we may ask, who were these people, who we may rightly regard as the first settlers in the Deccan, and of what physical character? When it is considered that many of the cultural traits which they established in the region have survived to this day, the hill villages, the terraced field systems, the importance of cattle, the ubiquity of axes, albeit of iron in place of stone, the oblong granite querns, the custom of making rock bruisings and paintings, and even in some cases the custom of extended burial, we may well expect to find among the modern population some who share their features. The skeletal evidence, in so far as we have been able to observe it, suggests that the bone formation was singularly heavy. This may have been partly due to the nutritious diet, rich in meat, millet and milk. The stature was medium to tall, and heads medium long and the jaws slightly prognathous. The skull is strikingly similar to one from Adichanallur, and also appears to resemble closely some of the modern inhabitants of Raichur (Pl. 18*a*). The main difference of physique we may expect is that many of the modern examples of this type are lean and wiry, due no doubt to restricted diet.

UPPER NEOLITHIC

It should now be clear why we have summarized the Neolithic culture in such detail. It is because many of the basic elements of life in the Karnataka region then established have continued down to the present day. Henceforward changes when they appeared did so as modifications of the existing culture rather than as complete breaks. Many of these changes were obviously brought about by external contacts involving perhaps the introduction of new culture traits without necessarily the arrival of new populations. Others almost certainly represent the arrival of new elements of population, but here, too, we may notice the probability that these new elements soon settled alongside the existing population, adhering to them and forming new social groupings as castes or classes. Some of these new elements, as we shall see, brought with them technological or economic advances which gave them from the start a dominant position. Thus we must expect to find those elements of population and culture which may most truly be called 'Neolithic' survivals among the socially inferior and economically depressed groups of the modern society. Yet they may, even so, not be quite the lowest, for there is the ever present possibility that hunting tribes may have adhered, at one time or another, to settled groups, and these would undoubtedly be accorded a yet lower status. Whatever the status, it is beyond all doubt that the basic elements of the Neolithic culture were frequently taken up by the newer sections of society and thus preserved.

The Upper Neolithic period appears to have been the beginning of a time of change when new cultural traits were already established to the north of the region and their repercussions were felt even in Raichur. The basic pattern of settlement seems to have developed rather than changed: there is evidence that the stone retaining walls and the little hill terraces were made and extended, and that the area of settlement probably increased. Certainly at Site VII there were important changes. The surface of the terrace was levelled and a mud or dung floor was spread in front of the living platform. This greatly increased the habitable area. On this new ground were made, if the evidence of one limited trench can be relied upon, post holes to take the structural members of wattle and daub huts of the *gudse* or *gudsulu* type still common throughout the area. We now have a vivid picture of the domestic scene. Outside the hut was a rectangular quern let into the floor, nearby a hearth with three standing stones of granite to act as a support for vessels. There is no evidence of any change in the stone industries during this period and they undoubtedly continued to supply the main tools used at Piklihal. For this reason we see fit to retain the name Neolithic, even though metal objects now make their first appearance. The evidence of Piklihal, in this respect, is very slight, but the copper chisel from Site VIII is of a type reminiscent of those from the Indus valley sites, and the evidence harmonizes with that of Brahmagiri (Pl. 56*b*, No. 10). These metal objects are still very rare and until more information is available it is not possible to say whether they were made locally or imported, nor, in the latter case, from where. Pottery, however, shows certain minor variations, even though the potter's craft remains basically similar to that of the Lower Neolithic. The A3 painted ware disappears, along with the red, black and ochre dressing: in its place a new painting technique develops, which is represented in the Lower Neolithic by a single example, the A2 grey ware with red ochre wash applied *after* firing. Further in the A4 and A5 wares a new technique of surface treatment, probably involving the application of some sort of gummy dressing which was burnished on to the surface, is found (Pls. 31-32). The A4 ware continues in the grey tradition of the A2, but the A5 appears to be trying to produce grey-and-black, buff-and-black, and even very rarely red-and-black imitations of the red-and-black ware technique. The A4-5 ware surface treatment is actually found in the Lower Neolithic, but it is much more common in the Upper. Another feature, more common in the later period, though found in the Lower Neolithic, is the rusticated or surface roughened ware (Pl. 28). Similarly, spouted vessels and several other pottery types occur only in the Upper Neolithic. Some of these already seem to be influenced by forms of the B1 ware. We have already noticed the single example of a bone point as evidence of a craft which may have appeared even during the Lower Neolithic, although it comes from this period. Likewise the wattle screen whose imprint is found of burnt daub fragments from this period suggests the craft of mat making. A solitary, unpublished sherd from Bellary carries a basket impression and testifies to the existence of this craft. The first occurrences of disc beads of magnesite or shell, and of beads of carnelian are from this period.

The economy of the period was probably little changed. The occurrence of bones of cattle, sheep and goat suggests that the cattle were still the dominant beasts. The finds of plastrons of a soft, water tortoise indicate that these creatures were hunted, brought back from the Krishna or some other suitable source, and probably used to augment the food supply. The single elephant bone recorded in a doubtful layer of this time may indicate that these animals were hunted or trapped. There is no further evidence regarding the physical type, the burial customs or religious beliefs of this period available in our excavations.

INTRUSION

We have mentioned above the possibility that towards the end of the Upper Neolithic period some sort of intrusion came to the region from the north. We have now to summarize the slender evidence which leads to this conclusion and consider the cultural level of the intruders. The evidence, at base, is this. At Brahmagiri and Piklihal there is a certain distinctive type of painted pottery with wheel-thrown rims. At the former site it is found in a pit grave lined with stone slabs and dug at an earlier date than the Iron Age cist grave which it abuts. The pottery in this grave includes red-and-black (B1) ware. The stone lined pit links it to Chalcolithic burials at Bahal (information from Dr. Subbarao). At Piklihal very few sherds of this intrusive AB ware were found (above p. 59). They appear to indicate that the intrusion took place at the end of the Neolithic occupation of Site VII (Pl. 35, Nos. 13–15). This is supported by a single find in Site VI. It is, however, strange that the form of the vessels and even the painted decoration are reminiscent of the A3 painted wares (Pl. 35, Nos. 1–3) and this might be taken to indicate an earlier date for the intrusion. However, the matter seems to be clinched by the contents of the Brahmagiri pottery pit. At Sanganakal numbers of sherds of this painted AB ware were found as surface finds, but none occurred in the trenches. The closest analogues for the AB ware come from Jorwe, Maharashtra, and support the thesis that the intrusion was from that direction.

We may thus conclude that during or at the end of the Upper Neolithic there was an intrusion from the north of people who brought with them a new type of painted pottery and the use of the potter's wheel. Even more clearly indicating their foreign nature is the new custom they introduced of burying the dead in places remote from habitation. This, and the red-and-black pottery of the Brahmagiri grave, would make them the vanguard of the Iron Age, breaking as radically with the earlier culture, as regards burial, as the inhabitants of Sialk 5 and 6. However, we have at present no distinct evidence as to whether the intruders had already adopted the use of iron, or whether as at Bahal they were still only using copper and bronze. It may well be that the famous Kallur swords belong to this time.

IRON AGE

We have already seen that there are only slight deposits of Iron Age date in any of the excavated sites at Piklihal and that these were rather explored with a view to establishing the sequence than to eliciting fresh cultural information about the period. Again we have noticed that there is evidence of continuity of culture, expressed at Brahmagiri by an overlap of Neolithic and Iron Age materials, although at Piklihal in some areas the Iron Age deposits are quite unmixed. Clearly, however, we cannot discuss the Iron Age culture in such detail as the Neolithic.

During the Iron Age the areas of habitation seem to have remained much the same as in the preceding period. At least there is a scatter of typical debris in almost every part of the site. There is no evidence for the house types, and no direct evidence for the technological bases of the economy. However, it may be safely inferred from the regular occurrence of iron tools and weapons in graves of the period, throughout the peninsula, that the use of iron became ubiquitous and rapidly supplanted the ground stone axe industry. Probably the use of stone blades would linger on for generations. Obviously elements of both these industries were preserved: the manufacture of querns, rubbers, palettes, etc., being continued in the old style almost to the present day, while blades are still taken from the site by villagers for use as strikelights. This is not the place to discuss the iron industry and its interesting range of tool types. We must note the possibility that the various smelting areas around Piklihal may go back to this period or at least provide an indication of the sort of site chosen. The potter's craft seems to have adopted the use of the wheel, although an important part of the range of vessels was made upon the turn-table and the whole range is rather more typical of such techniques than of the wheel. In the light of recent work there seems to be no doubt that the red-and-black ware, which from the point of view of forming, surface treatment, and many other craft aspects, is closely related to that of Rajputana and western India, represents a cultural spread into the Deccan from the north. We have already seen the earliest evidence of this wave of movements in the intrusion, and discussed the date at which iron working came to be adopted in the Deccan. There is no evidence that the people who brought iron working techniques to Piklihal introduced either a new system of agriculture or new crops. Nor do the bones suggest that the basically pastoral nature of the economy was changed. The cattle bones still predominate beside smaller numbers of sheep and goat.

If the material for the study of the life of the Iron Age is lacking at Piklihal that for the study of funerary monuments, etc., is abundant. Excavations at Sites II, III and IV showed that the graves lying on the plain around the settlement areas belong to this age (Pls. 8 and 9). Similarly, stone alignments were erected alongside the graves, perhaps for some related ceremonies. Once again this is not the place to discuss the affinities of the stone cist graves, alignments, and other monuments to 'Megalithic' remains elsewhere, still less to discuss their relationship with a mysterious 'Megalithic civilization'. Here in the Deccan they appear, as we have seen, upon sites already chosen for the slab-lined pit graves of the intrusion, which were the first sign of the introduction of new rites. The Neolithic burials involved in all recorded cases simple inhumation (except for infant inurnments). Now the cists seem often to be rather family ossuaries in which the bones of many persons were deposited. In any case the excavations at Piklihal did not undertake to study the questions raised by the graves.

EARLY HISTORIC

The Early Historic period witnessed a new construction in Site VII. This was associated with a yellow gravel floor and a small pit containing a deposit of metal objects. Outside this floor there were traces of a new stone wall. Otherwise the greatest concentrations of pottery of the period were found scattered east of C, A, and near K (Pl. 6). There is little indication that any of these settlements was of any great size and the small scale of the excavation does little to provide cultural information. The picture obtained at Piklihal is thus too limited to give much indication of the great changes which the period is known to have witnessed, although it supplies enough detail to show the close comparison of culture traits with those of neighbouring Maski, or of Brahmagiri or Chandravalli. However we may recall that of these settlements Piklihal alone, for all its apparent insignificance at this time, found its way into the pages of Ptolemy's Geography (above p. 3).

It is clear from the depth of soil accumulation beneath the Early Historic levels that during the preceding periods the work of maintaining the stone terrace walls must have continued. Also probably the denudation of the upper hill-tops continued to contribute to the wash-down of soil on to the lower terraces. The hut built at Site VII must still have been a very temporary affair, little different from those of the Neolithic. It is unfortunately not possible to determine whether there was a more permanent village settlement in the Area C, but surface finds seem to indicate it. The pit deposit of iron objects indicates that the general techniques and types of the ironsmith's craft must have continued with little change from the Iron Age. The copper gilt ear disc typifies the new luxury objects of the period. The potter's craft shows important new developments. In the beginning red, black and red-and-black surfaces are found, and, although the red ware later becomes the most common and the surface burnish of the Iron Age disappears, the basic surface treatment seems to have changed little from the Iron Age. This indicates the continuity which exists between the two periods. The forming techniques, however, show an important change. The use of the wheel becomes almost universal, except for very large storage pots, hand-made tanks of terracotta, etc., and, even though combined with a typical use of the dabber and anvil, it is markedly distinct from the turn-table techniques of the Iron Age. With the wheel there comes a new degree of standardization of forms. Another new feature is the evidence which now occurs of importation of specialized wares from outside the region: the red polished (C2) sprinklers, probably from such centres as Kondapur, and the rouletted ware (C1), from (perhaps) centres on the east coast. Both of these wares had local imitations. Particularly the rouletted ware was copied locally, as well as regionally imitated by specialists. One such regional variety has been noticed at sites in the Raichur Doab as far scattered as Piklihal, Koppal, and Utnur. The B2 painted ware is a local peculiarity: closely linked to the so-called Coimbatore grave ware, it appears in forms and techniques which associate it with this period; although certain perplexing features suggest that it may be a survival of a much older ware and decorative technique. Among the pot forms some now link Raichur with the whole subcontinent. These serve to emphasize the breaking down of older provinciality in the first centuries A.D. Among other evidences of this change we may note the copper gilt ear disc from the deposit in Site VII and the fine stone disc (Pl. 56*a*). These belong to a class known not only from the earlier excavations at Maski, but from sites throughout India. Again, there is during the period a much greater range of beads than were found in either the Iron Age or Upper Neolithic.

The animal remains show a continuance of the popularity of the humped cattle, and now for the first time, though still uncommon, bones of the buffalo appear. It must be concluded that in this area at least the buffalo was not adopted as an animal of domestic use until the beginning of the Christian era, or even later. Sheep and goats were also recorded, but in small quantities.

Early Medieval

We have already noticed that very few remains assignable to this period are found at Piklihal. It is probable that a small settlement existed in the region of Area C and that the cinerary urns found near the surface of Site I date from this time.

Medieval

During the medieval period the only regular habitation was within the fortified Area C. Here there are still stone foundations which testify to a fairly large settlement. Only one small pit was excavated within one of these foundations to produce a sample of the material remains. The pottery was typical D ware, there were also numbers of broken bangles of glass and shank, and of beads. The animal remains included cattle, buffalo bones, sheep and goat. The only other activity which can be ascribed to this period is the iron smelting of which the pit in Site VIIIB is taken to be evidence. The chronology of the period has already been discussed. It is however clear that at a certain date the settlement was abandoned and since that time the hills of Piklihal have been visited only by cultivators who still maintain the terrace fields and plough all but the smallest, and goatherds who graze their flocks among the ancient settlements, sometimes picking up a stone blade for use as a strikelight.

CONCLUSION

Possible Origins of the Deccan Neolithic

The implications of our comparative study of the traits of the culture may now be stated in the form of a hypothesis. It has been suggested that in the last centuries of the third millennium there was considerable folk movement in the Iranian plateau. This in part is associated with the eastward spread of Bronze Age cultures, but it has also been seen as a movement from Central Asia. At least in part it must be connected with the turbulent tribes of Indo-European speaking peoples. We shall return to the supporting evidence of other disciplines shortly, but let us first outline our archaeological hypothesis. An unknown group of tribes, probably pastoralists with sheep and goats, perhaps also cattle, in the last centuries of the third millennium were in the region of the Turkoman steppe and the Elburz mountains. There they were in contact with the eastward extensions of the grey-ware complex, and this contact is reflected in their pottery; they maintained a typical Neolithic/Chalcolithic stone blade industry and, if and when, suitable raw material was available made ground stone axes in much the same tradition as those earlier attested at Hissar and Sialk. It is to be expected that they also had knowledge of copper and bronze. The probability is that this first stage did not last long, for driven by pressure from the north and west they moved southwards through Seistan, either into the south of Baluchistan or else eastwards via Arachosia into the Indus valley. What was the nature of their contact with the Late Harappan culture cannot be stated at present, but it is probable that they underwent in this region a period of adaptation and change. Perhaps some groups became attached to the cities as herdsmen or perhaps as true nomads 'acquired' various culture traits from them. At any rate it must have been at this time that they acquired the *bos indicus* as an all-important part of their economy, and began a trade contact with the cities. Whatever the case, distinctive terracottas have been found at Harappa and Chanhu Daro identical to Deccan types, while pottery, which must belong to some phase of the movement we are following, occurs alongside the Harappan pottery at Lothal. The suggestion is that at least some of these pastoralists, together with their cattle, then moved eastwards across Sind and Saurashtra and turning southwards gained the forests and grasslands of the Deccan plateau, then only sparsely inhabited by hunting tribes. This movement may also have been made under pressure from the west, while their southern deflection into the Deccan suggests that already other settlements existed in Rajasthan and the Malwa plateau to prevent their following the more obvious course to the north-east and settling in those regions. The first sites at which we can trace evidence of their remains are Bahal and Prakash. Thence they spread southwards until they reached the North Karnataka region, where the open grasslands were so plentiful and the conditions of life so favourable. They must have been the first food producing inhabitants in this region. Here, under the impetus of a plentiful supply of raw material, they revived the ground stone axe craft to make these tools a major element in their equipment.

If this archaeological hypothesis is correct, and if our observations of the subsequent development of settlement in the Deccan are accepted, then certain unexpected conclusions arise. It would follow that at least a significant substratum of the modern population can claim ancestry from the first settlers of the Neolithic period; and that, if racial characteristics are retained over long periods of time, this sub-stratum might be expected to be found superimposed upon the Veddid or Australoid elements. It would also seem to follow that, in the absence of any better claimant, this stratum of settlers must have been responsible for the introduction into the Deccan of the Dravidian family of languages. Neither of these extensions of inference is without support. The skeletal evidence of Piklihal shows that the settlers were closely allied to one of the elements in the modern population, perhaps related to Guha's 'palaeo-mediterranean' stock, and probably associated with one of the two ancient strains found in Iran and Turkestan.[1] Perhaps the older name 'Dravidoid', with all its linguistic connotations, is to be preferred, for reasons we shall discuss below. This Dravidoid stock appears to have been very widely spread throughout the Iranian plateau, and even Central Asia, in pre-Bronze Age times. It has been identified in Central Asia by Soviet archaeologists and anthropologists in the Keltiminar culture and even in the subsequent Bronze Age.[2] In spite of the confusion and lack of clarity which has distinguished so much of the physical anthropologists' writings upon the topic, it has been generally accepted that this element must have moved into Peninsular India from Iran, and have been superimposed upon the pre-Dravidian or Veddid elements. The origin of the Dravidian languages has also given rise to varied opinions. Coldwell long ago hinted at affinities with Finno-Ugrian. These have been further explored by Burrow with some success.[3] The whole question has been recently reviewed by Tolstov.[4] All these writers have sought to establish the Finno-Ugrian affinity, and while this has hardly been accepted by Finno-Ugrian scholars, it seems to be the most solidly based theory yet advanced. The presence of a Dravidian dialect, Brahui, in Baluchistan, spoken to this day by a group of semi-nomadic pastoralists, fits well into the archaeological picture. What, however, is still far from clear is whether the Dravidian languages were originally extensive in Iran, or whether the Neolithic migrants of the Deccan were already speaking a Dravidian dialect before they moved into Southern Iran, Baluchistan and Sind. This has obvious bearing upon the determination of the language of the Indus cities, for it is possible to argue in two different ways: either the languages of the Indus cities (and for that matter of ancient Iran) may have belonged to the Dravidian family, and have been adopted by our pastoral nomads during their contact with those areas, or they may have been of a different, as yet undetermined family, and the nomads were, from the first, Dravidian speakers. Whatever the conclusion may be, it is as well to recall that a great part of the folk movements associated with the grey-ware complex was of Indo-European speakers and even this possibility cannot be altogether ruled out in connection with our Deccan Neolithic. For this movement into the Deccan cannot be far removed in time from the first wave of Indo-Aryan invaders. Tolstov, however, has gone so far as to associate the Dravidian language family with the Dravidoid stock and sees in the movements of peoples of the Neolithic Keltiminar phase of Khorezm, in the last centuries of the third millennium B.C., the starting point of the movement into India. He has thus provided the complement to our own archaeological hypothesis. It remains now for further factual evidence to be produced, from excavations in India, Pakistan and Iran; from more positive anthropometric work in India; and from further comparative linguistics; to test the validity of the several theories we have advanced.

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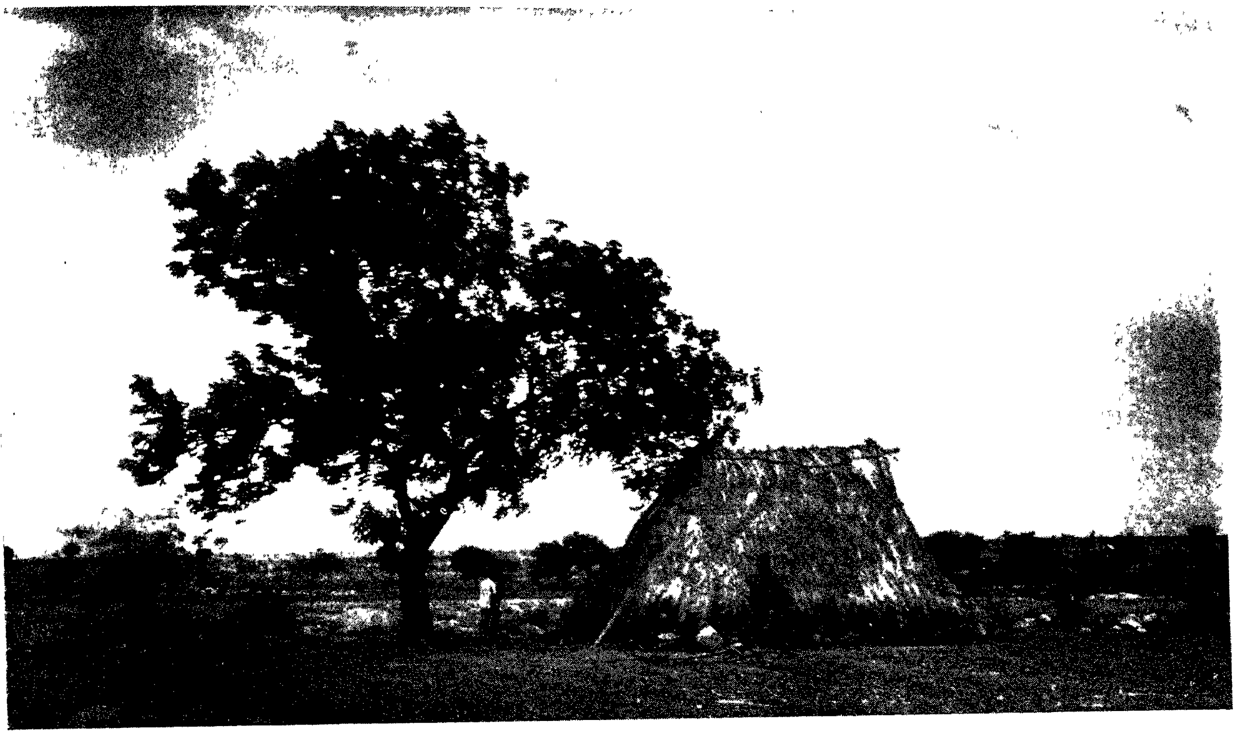
[1] cf. H. Field: *Contributions to the Anthropology of Iran*, Chicago (1939), 257–277, and T. A. Trofimova, 'Palaeoanthropological remains coming from the territory of ancient Xorezm', *East and West*, VIII (1957), No. 11, and the same writer's 'Craniologicheskie Materiali iz Antichnih Krepostiy Kalali-Gir 1 and 2', in *Report of the Khorezm Expedition*, II, Moscow (1958), pp. 543–637. Also B. S. Guha: *Racial Elements in the Population*, Bombay, 1944.

[2] Tolstov, S. P.: 'Prehistoric Cultures of Ancient Chorasmia', *I.A.A.R.*, 1955-56, p. 14.

[3] Burrow, J.: *B.S.O.A.S.* (1943).

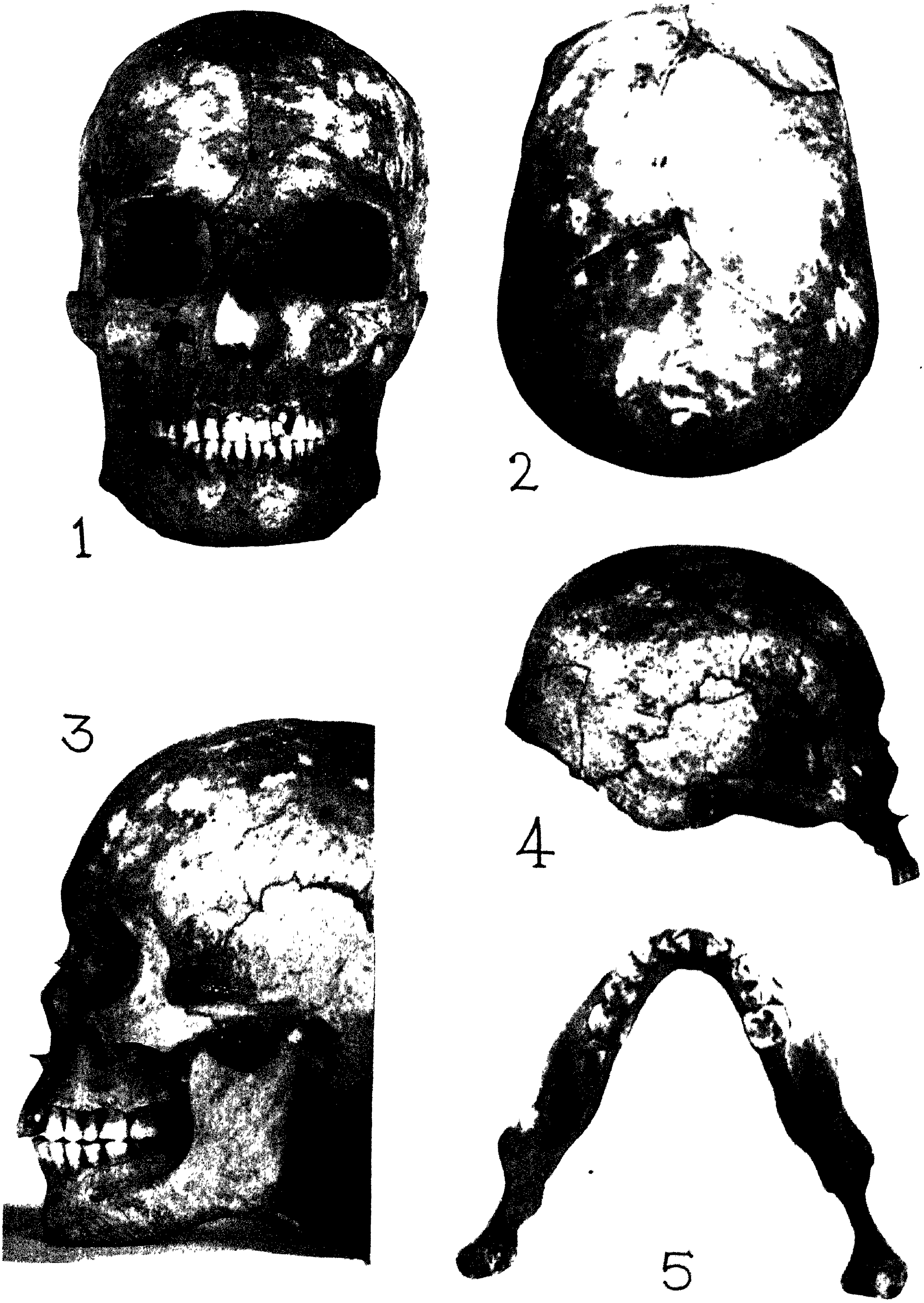
[4] Tolstov, S. P.: *Po Sledam Drevnie Khorezmiiskoi Tsivilizatsii*, Leningrad (1948), pp. 72-73; and *Drevnii Khorezm*, pp. 65 and 350.



(a) Field house near Piklihal

(b) Farm house near Piklihal : the cattle are herded in the courtyard and the house itself

PLATE 61



Female skull from Site VII

Appendix I

REPORT ON HUMAN SKELETAL REMAINS EXCAVATED AT PIKLIHAL NEAR MUDGAL

by

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The skeletal remains excavated at Piklihal and sent for study to the Institute of Anatomy, Stanley Medical College, Madras, comprise bones belonging to three human subjects and an assortment of animal bones and other small bony fragments. The bones were very fragile and partly fossilized. Of the three skeletons, one was that of an adult from Site VII and another that of an adult from Site VIII. Some minor parts of the skeleton of a child from Site VII constituted the third set. The human skeletal material has been examined and studied and is reported on below.

THE ADULT SKELETAL MATERIAL

Age and sex.—From an inspection of the bones it is obvious that the two more complete skeletal sets belong to adult individuals. The adult skeleton from Site VII appears to be of female sex and that from Site VIII to be male. All the evidence from a study of the bones points to this conclusion, and there is none of any sort to raise a doubtful opinion. Hence the material provides two adult skeletons, one that of a female and the other that of a male.

SKULL: GENERAL FEATURES

Norma frontalis (Pl. 61, No. 1).—In cranial form both specimens resemble in general the modern South Indian skull. The forehead is well marked, vertical in the male, but slightly receding in the female. The frontal eminences are not prominent, the supraorbital ridges are well developed smoothly rounded in the female and somewhat rougher in the male. The orbital outline is rectangular with rounded angles. The nasal root is only slightly depressed; the nasal bones are small, curved from side to side and from above downwards. The nasal apertures are vertically elongated and the nasal spinem is well marked in each subject. The zygomatic bones are prominent. The subnasal part of the maxilla is directed somewhat forward indicating a slight degree of subnasal prognathism. The canine fossa is well marked. The teeth come into correct occlusion the maxillary incisers having a slight overbite. The chin is very prominent and projects forwards below a depression between the alveolus and lower margin of the mandible.

Norma verticalis (Pl. 61, No. 2).—Seen from above, the vault of the skulls is full and rounded, that of the female specimen appearing slightly elongated. The broadest part of the skull is the region of the parietal eminences. From the parietal eminences the outline narrows slightly towards the frontal bone and terminates anteriorly at the forehead in a well-formed frontal arc. Posteriorly the outline passes convergently over a rounded occipital arc.

The zygomatic arches are not visible from above, a clear indication of the preponderant development of cranium as compared with the face, i.e. the skulls are cryptozygous.

The sagittal and other sutures are well serrated as in modern skulls.

Norma lateralis (Pl. 61, Nos. 3 and 4).—As has been remarked already the forehead is well developed though slightly receding in female. The vault appears to be well arched with a smooth contour. The male skull is the higher vaulted of the two. The temporal lines are only faintly marked posteriorly. Their position is low compared with typical dissecting room specimens. The squamosal suture between the temporal and parietal bones is a well curved circular sutural arch. The pterion is formed by the articulation of the anterior-inferior angle of the parietal with the tip of the anterior-inferior angle of the parietal and the tip of the alisphenoid. The zygomatic arch is sturdy and well formed. The articular tubercle is prominent and the glenoid cavity forms a well-marked depression bounded superiorly by the squama and posteriorly by the tympanic plate. The post-glenoid tubercle is of normal size. The mastoid process is strikingly developed in both specimens. The occipital region of the skull is full and rounded. The nuchal lines are discernible as usual and the external occipital protuberance takes the form of a sharp spine in the female skull and of an overhanging ledge in the male.

Norma occipitalis.—The vault is full and shows the rounded pentagonal form common in modern skulls and from the parietal eminences. The outline of the side of the skull drops vertically down with a slight inclination medially to the mastoid process. The digastric fossa is overhung by the tip of the mastoid process. The nuchal crest and the nuchal lines are emphasized in the male skull where the region of the inion forms an overhanging ledge of bone for 2 cm. Apart from the exaggeration of the external occipital protuberance no transverse occipital crest is observable.

Norma basilaris.—The outline of the occipital region is full and rounded. The nuchal lines and the external occipital protuberance have already been referred to in describing the occipital aspect. The foramen magnum is placed well forward when compared with recent dissection room skulls. The articular tubercle, glenoid fossa and mastoid process have also been commented on in condensing the lateral aspect. The zygomatic arches are slightly convex laterally as is usual in modern skulls. The dental arcade formed by the teeth and alveolar arch is parabolic as in modern skulls, and the palate is deep. The alveolar process is roomy and there is ample space for the teeth with a small free area behind the last molar.

MEASUREMENTS

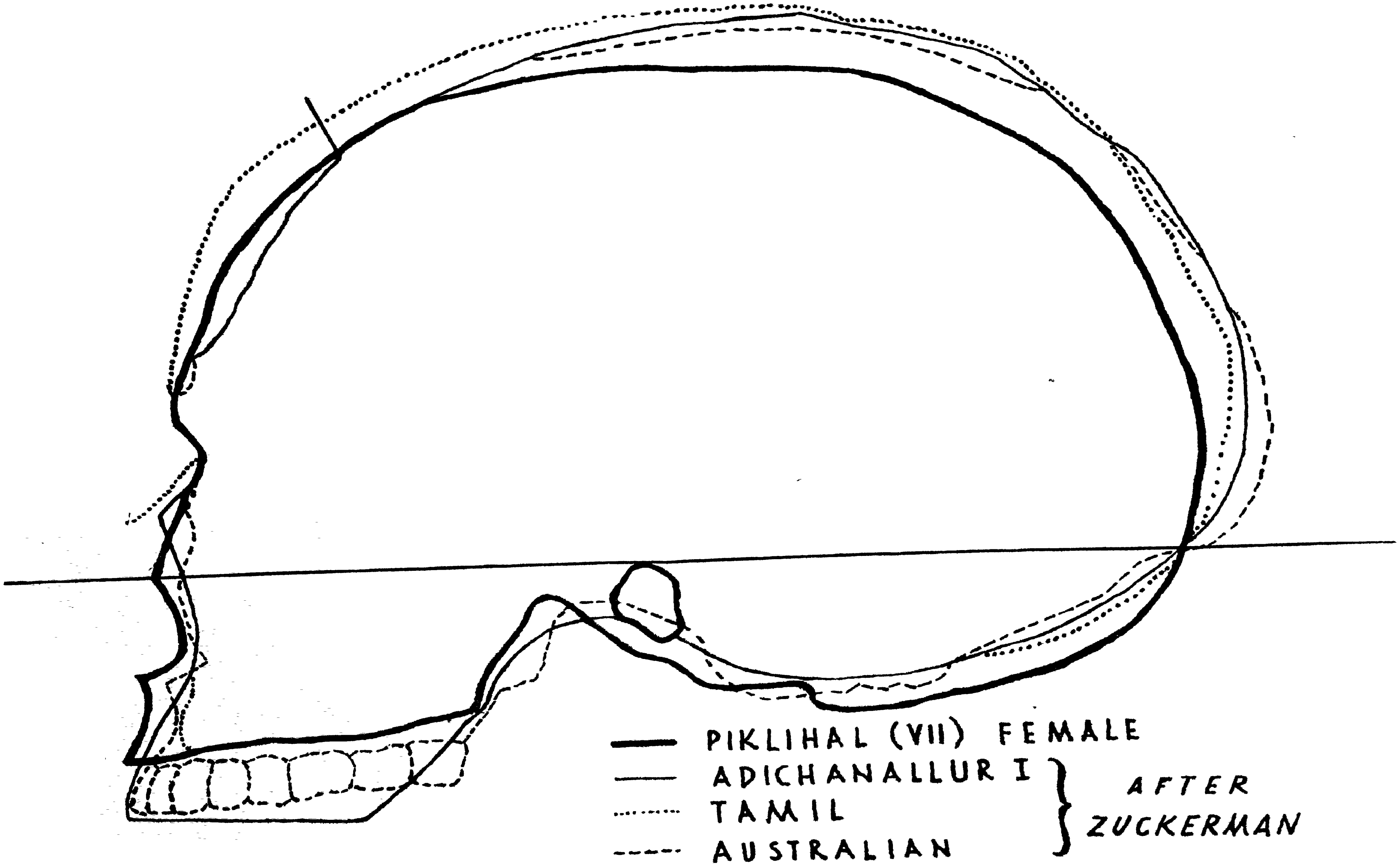
The skulls were measured according to standard anthropometric techniques and the most important measurements recorded are given in Table I. The indices calculated from some of the absolute measurements are given in Table II.

TABLE I

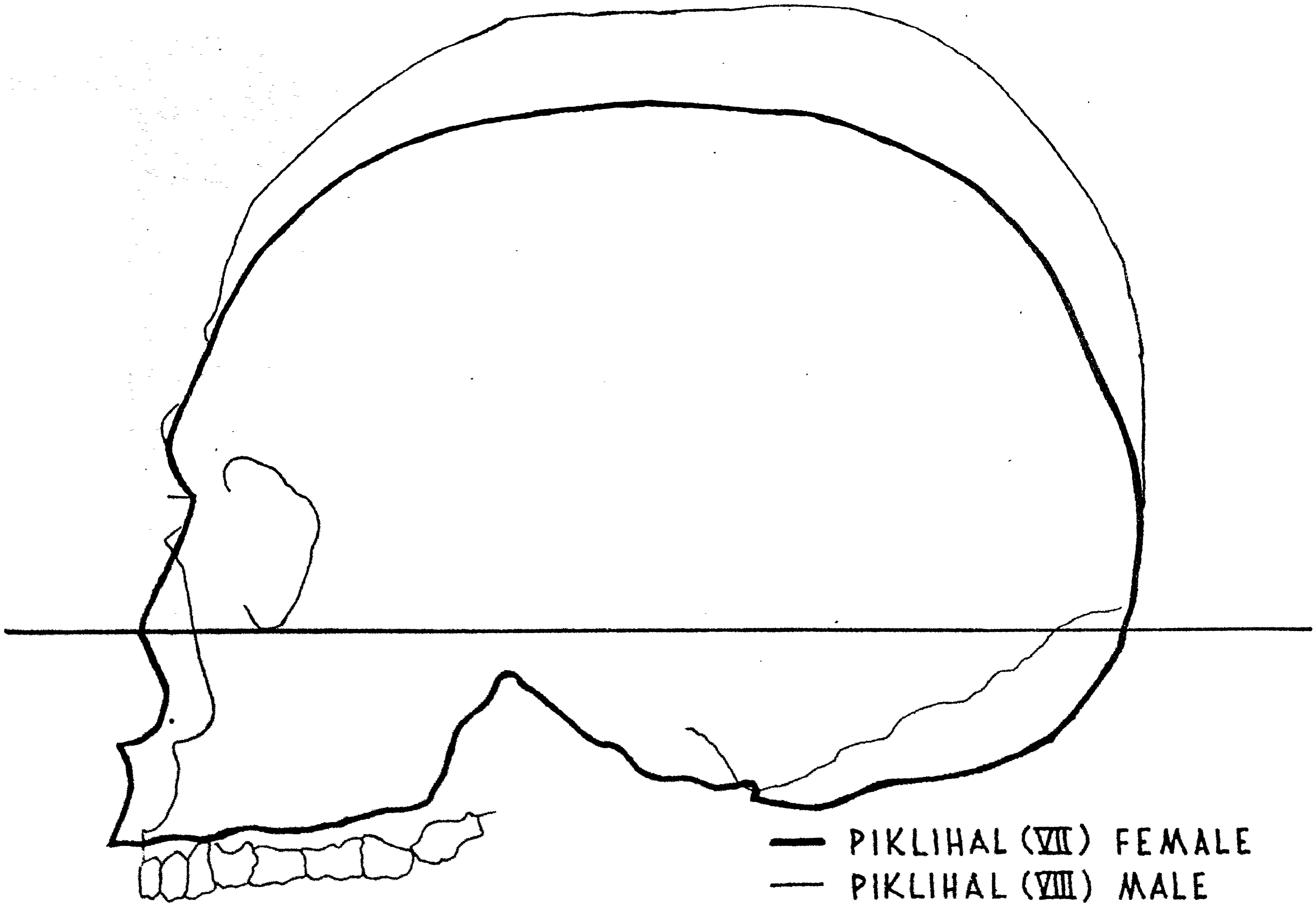
Absolute measurements in mm.

Character	Female skull Site VII	Male skull Site VIII
Cranium		
Maximum cranial length	175	172
Maximum cranial breadth	131	139
Basi-bregmatic height	131	141
Auriculo-bregmatic height	110	124
Minimum frontal breadth	94	95
Maximum frontal breadth	106	113
Bizygomatic breadth	128	126
Basi-nasal length	95	103
Basi-alveolar length	96	100
Upper facial height	67	66
Nasal height	46	45
Nasal breadth	23·5	23
Orbital breadth (right and left)	41	45
Orbital height (right and left)	33	35
Interorbital breadth	22	26
Alveolar length	52	53
Alveolar breadth	45	63
Glabello-inial length	165	172
Nasion-gnathion line	111	123

PLATE 62



Profile contour of Piklihal skull superposed on other examples



Profile contours, male and female skulls

TABLE I—*contd.*

Character	Female skull Site VII	Male skull Site VIII
Cranium—*contd.*		
Palatal length	50	45
Palatal breadth	43	45
Frontal arc	125	140
Parietal arc	125	123
Occipital arc	110	103
Vertical transverse arc (biporionic)	296	337
Maximum horizontal circumference	490	485
Mandible		
Bicondylar breadth	116	117
Bigonal breadth	102	93
Height of ramus (right)	67·5	66
Height of ramus (left)	66·5	66
Maximum breadth of ramus (right)	39·5	—
Maximum breadth of ramus (left)	37·0	45·0
Minimum breadth of ramus (right)	35·5	34·5
Minimum breadth of ramus (left)	34·0	34·5
Symphysical height	30·0	35·0
Height of corpus (between first and second molars)	30	32
Maximum thickness of corpus (between first and second molars)	15	18
Mandibular angle	110°	124°

TABLE II

Indices

Cranial index	74·9	79·4
Cranial height index	74·9	80·6
Cranio-auricular height index	62·9	72·7
Gnathic index	101·0	97·1
Upper facial index	52·3	52·4
Orbital index	80·5	77·8
Nasal index	51·1	51·1
Palatal index	86·0	100·0

SKULL: SPECIAL FEATURES

Cranial capacity.—The cranial capacity of the female skull, which was reasonably intact, was determined by filling it with small pulse seed. The mean of two fillings on different days yielded a capacity of 1,252 c.c. An indirect method of determining capacity by the use of Hooke's (1926) formula for female skulls involving length, breadth and basi-bregmatic height which is more reliable than those of Welcher and Lee and Pearson, gave a reconstructed capacity of 1,299 c.c., which is 47 c.c. greater than that obtained by direct measurement but does not agree badly with it. The male skull was not sufficiently intact for its capacity to be measured directly, but according to Hooke's formula for males is 1,441 c.c., a value greatly in excess of the average for South Indians, 1,208 c.c. (Rao and Ayer, 1942) and Australian aborigines, 1,290 c.c. (Wood-Jones, cited by Zuckerman, 1930) and that for the ancient South Indian skull from Adichanallur, 1,268 c.c. (Zuckerman, 1930).

Cranial index.—The index of the female skull is 74·9 and that of the male skull 79·4. The female is dolichocranial, just one point below the limit mesocranial and the male mesocranial, only six points below the lower brachycranial limit. This may indicate that a mixture of racial types has already taken place, resulting in the occurrence of slightly differing head forms in the same population. Guha states that the Mohenjo Daro and Harappa skulls from the Indus Valley are a mixture of dolichocephalic and brachycephalic specimens (Guha, 1939: *Racial Affinities of the People of India*, cited by Boule and Vallois, 1957). In any case the uniformly present dolichocranial nature of the Australian aboriginal skull is not noted here. The South Indian dissection room specimen is pre-eminently dolichocranial with a cephalic index of 73·6 but high mesocephaly, and low brachycephalic skulls are also frequently met with.

Cranial height indices.—The cranial height index between basi-bregmatic height and cranial length is 74·9 in the female and 80·6 in the male, the former being just below the hypsicranial limit and the latter markedly hypsicranial. The height index derived from the ratio of auriculo-bregmatic height to cranial length is 62·9 in the female and 72·7 in the male, again slightly below the hypsicranial limit in the female and markedly hypsicranial in the male. The height of the vault is an indication of the upward and general expansion of the skull in evolution. These skulls are quite different from Australian aboriginal and Adichanallur skulls which have a definitely lower cranial vault. Recent South Indian skulls from the dissection room, on the other hand, show considerable hypsicephaly.

Upper facial index.—This is the percentage ratio of upper facial height to bizygomatic breadth. The index is 52·3 in the female and 52·4 in the male. In the classification of values these fall within Martin's mesene group (between 50 and 55): such a value of the facial index is not disharmonic in relation to the shape of the head in either instance.

Nasal index.—This is the percentage ratio of nasal breadth to nasal height and its value is 51·1 in both the male and the female specimens. Their nasal form is thus at the border zone between mesorrhiny and chamaerrhiny, this tallies closely with the values of nasal index for Tamils, 51·6 (Zuckerman, 1930) and 51·9 (Ayer, 1932) and is quite separated from that of the Australian aboriginal.

Orbital index.—This is the percentage ratio of orbital height to orbital breadth. The value for the female is 80·5 and that for the male 77·7. Both specimens belong to the type of mesoconchic class, resemble the present South Indian and differ from Australian aboriginal and Adichanallur skulls (Zuckerman, 1930) in both of which it is much higher. The lowering of the orbital roof is a phenomenon concurrent with the evolution of the forehead and the expansion of the brain.

Orbital tubercle.—A prominent orbital tubercle (Whitnall) occurs at its usual position, shortly posterior to the middle of the lateral margin of the orbit on the frontal process of the zygoma.

Palatal index.—This is the percentage ratio of palatal breadth to palatal length. In the female the index is 86·0 and in the male 100·0. In both instances it is brachystaphyline, indicating a wide palate with plenty of space for accommodation of teeth. This is as is to be expected in an ancient people with widely different food habits from modern man. However, the value of the palatal index in the Australian aboriginal and Adichanallur skulls is very much higher.

Facial angle.—The facial angle is formed by the inclination of the nasion-prosthion line to the Frankfurt horizontal as drawn on a profile tracing of the skull (Stibbe, 1930). The tracing was made with the orthodioptograph. The male skull gave values ranging from 85° to 88° in different tracings and the female skull gave values from 77° to 79°. The male is more orthognathous than the female.

The female skull shows slight subnasal prognathism. Adichanallur skull No. 1 has a facial angle of 78° as estimated from Zuckerman's drawing (Zuckerman, 1930) and it appears similar in facial profile to the female skull described here.

Gnathic index.—The gnathic index being the expression of the percentage ratio between the basi-alveolar length and the basi-nasal is also a measure for the assessment of prognathism. The gnathic index of the male skull is approximately 97·1 and that of the female 101·0. Adichanallur skull No. 1, as computed by us, has a gnathic index of about 107·0.

Lower jaw (Pl. 61, Nos. 3 and 5).—The mandible is well formed with a pronounced chin in both specimens, but better marked in the male. The posterior aspect of the symphysis presents the appearance as in modern bones with genial tubercles. The digastric fossa is well marked being similar to the condition found in recent specimens. The transverse ridge above the digastric fossa is better marked than in many modern specimens. The muscular markings for the masseter and internal pterygoid are very distinct. The angle of the mandible is slightly bent down and appears everted in the female specimen. The dental and alveolar arcade is a wide parabola. There is ample room for the teeth in the male mandible, but in the female specimen the anterior teeth, i.e. the incisers and canines, are overcrowded. The coronoid process, mandibular notch and condyle are as in recent specimens.

Teeth.—The upper jaw of the female shows all the eight teeth of the left side, but the last molar has been lost on the right. The maxillary dental arcade in the male is completed. The teeth are similar to modern teeth, the canine being level with the rest. The third upper molar, showing three cusps only, is the smallest of the molar series, the first molar being the largest. The teeth show signs of attrition, abrasion, and breakage, but no evidence of caries. The mandible has only six teeth on the right side and seven teeth on the left in the female, the posterior teeth having been lost. The dental arcade of the male also shows gaps at the site of the second left lower molar and first right molar. The lower dentition shows signs of attrition and abrasion. There is no sign of caries.

Contour of profile outline (Pls. 62 and 63).—The profile contour was drawn by means of the orthodioptograph. The skull was first oriented to Frankfurt horizontal in the cubic craniophore; and the cubic craniophore with the skull was gently turned on the side so that the left lateral aspect was upwards in order that the outline of the left norma lateralis could be drawn.

The length of the female skull was nearly equal to that of the Adichanallur skull studied by Zuckerman (1930) and hence the tracing of profile contour was superimposed on to the profile contours of the Adichanallur, Australian and the Tamil skulls provided by Zuckerman (1930) in his Text-figure I. It revealed the interesting fact that the Piklihal female skull had a profile between the Adichanallur and Tamil skulls. The profile contour of the male skull was not superimposed on to the same diagram as it had a slightly different length and it was thought inadvisable to overcrowd the diagram. So the profile contour of the male skull from Site VIII and the female skull from Site VII were superimposed in one diagram. It was noticed that the male skull overshadowed the female skull in its more vertical forehead and vertex height. It thus appeared to have a very close resemblance to the Tamil skull. The close resemblance of both the male and female Piklihal skulls to the South Indian Tamil skull is a noteworthy fact.

VERTEBRAL COLUMN

Cervical, thoracic and lumbar vertebrae.—Of the female skeleton from Site VII, the following cervical vertebrae were available: the atlas; part of the third cervical vertebra, comprising its body and the neural arch of the right side; the fourth cervical vertebra with its spinous process and left transverse process injured; the fifth cervical with the laminae broken, the sixth cervical with its neural arch and left transverse process destroyed; and the seventh cervical with the lamina of the right side broken. Among the thoracic vertebrae which are all present the lamina of the first and the body of the third thoracic vertebrae are broken and destroyed. All the lumbar vertebrae are present. Of the male skeleton from Site VIII the following cervical fragments were available: a fragment of atlas showing the right half of the posterior arch with part of lateral mass and transverse process, a fragment of axis with an adherent bit of the lamina of the third cervical vertebra and another fragment of axis including the dens with an adherent moiety of the anterior arch of the atlas.

The vertebrae generally resemble modern specimens. The odontoid process appears to be small as is indicated by the male skeleton. As the spinous processes of the third to sixth cervical vertebrae were defective no opinion could be given regarding the bifid termination of their spinous processes. The thoracic vertebrae are missing. Among the lumbar vertebrae the fifth lumbar was more or less intact. Fragments of the bodies of the third and fourth and of the neural arches of the upper four lumbar (para) vertebrae are found. The measurement of the vertical diameter of each lumbar vertebra was taken in the median plane at its ventral and dorsal surfaces. The general lumbar index was calculated as the percentage ratio of the dorsal vertical diameter of the lumbar vertebrae to the ventral vertical diameter of the lumbar vertebrae (Wilder, p. 77). The individual measurements and the index for the female skeleton are as follows:—

	Lumbar Vertebrae					Total	Index
	1	2	3	4	5		
Dorsal vertical diameter ..	2·3	2·4	2·4	2·1	1·8	11·0	94·00
Ventral vertical diameter ..	2·3	2·5	2·5	2·3	2·1	11·7	

The general lumbar vertebral index as given by Cunningham (Wilder, p. 78) is 95·8 for Europeans, 105·4 for Negroes and 104·8 for Andamanese.

In an extensive study of fifty lumbar vertebral columns of South Indians, Hari Rao (unpublished thesis, 1958) obtained a general lumbar vertebral index of 88·7 with range from 97·2 to 77·8. All the individual lumbar vertebrae excepting the first show the wedge-shaped character with an increased ventral diameter in accordance with the general anterior convexity of the lumbar vertebral column.

The last lumbar vertebra shows spondylolisthesis. There is separation of the centrum and the anterior segment of the neural arch with transverse processes and superior articular facets as one piece and the laminae, spinous process and inferior articular processes as another piece. During the life of the individual the union between these two moieties should have been effected by fibrous tissue or cartilage as indicated in the finely tuberculated rough surface of the junction between the two moieties.

The body of the fifth lumbar vertebra shows evidence of osteoarthritic changes. There also appears to have been a lateral distortion of the vertebra as if the vertebral body has been shifted to the right side in relation to the neural arch.

Sacrum and coccyx.—The sacrum of the female skeleton occurs as three incomplete fragments, so that even when put together the bone is not complete. One fragment consists of the right sacro-iliac articular surface with the right ala of sacrum and parts of first two centra. The second fragment consists of the left part of the first centrum and part of left ala and corresponding sacro-iliac joint surface. The third fragment consists of parts of the third, fourth, and fifth centra with their left transverse processes and the lower two anterior and posterior sacral foramina and the fused spinous region with the second, third and fourth spinous processes. The united laminae of the second, third, and fourth sacral segments forms the dorsal wall of the sacral canal in this fragment.

Of the male skeleton only one fragment of the sacrum is present and consists of the posterior part of the right half of the first sacral segment, its pedicle and right superior articular process and parts of the laminae of the upper three sacral segments.

The first segment of the coccyx in the female skeleton is present.

The sacrum and coccyx generally show the usual characters met with in recent bones. The auricular surface for articulation with the ilium corresponds to the sides of the first two segments in the female.

The sacral hiatus is formed only by the absence of the laminae of the fifth sacral segment. The margins of the sacral hiatus inferiorly terminate in the cornua. The inferior angle of the sacrum and the notch immediately caudal to it are well marked.

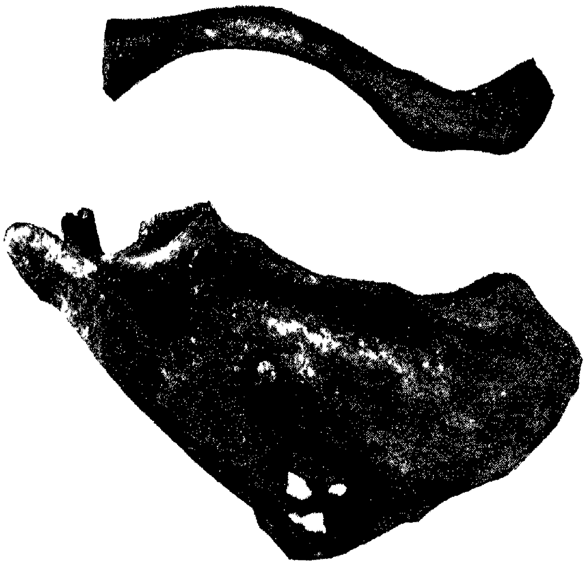
The transverse process of the first segment of the coccyx is noted.

STERNUM AND RIBS

Sternum.—Of the female skeleton a fragment of the sternum is present consisting of the major part of the body of the sternum but damaged at the upper end.

The available fragment of the body of the sternum of the female skeleton indicates articular facets for the second to the seventh costal cartilages.

PLATE 64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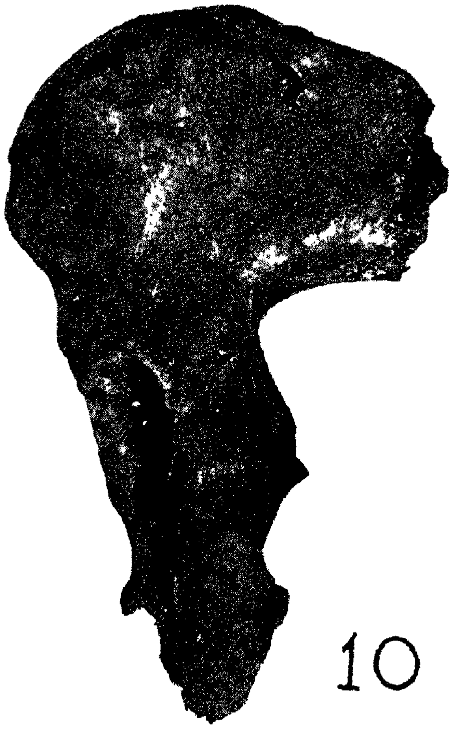
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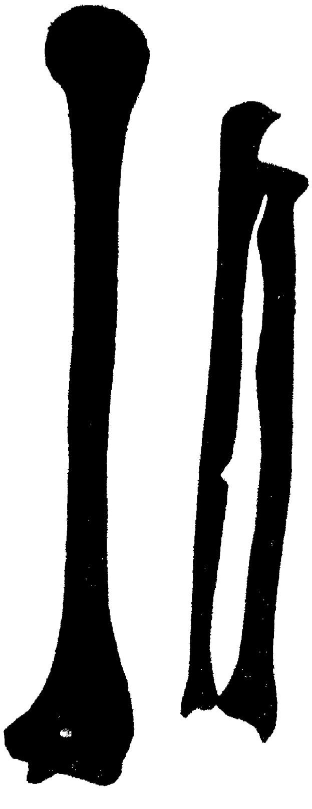
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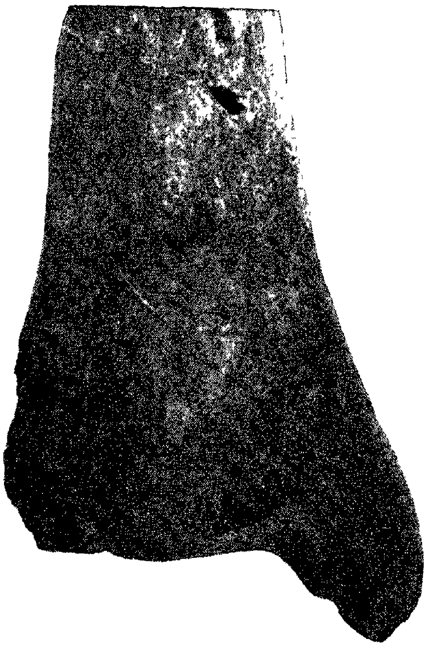
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Female skeleton from Site VII

Ribs.—Most of the ribs of the female skeleton from Site VII are present, the upper ones in good condition and the lower ones considerably fragmented.

Of the male skeleton many fragments were found.

There is a well-marked facet at the site of the scalene ridge on the upper surface of the first rib of the female, the facet being much better marked on the right side. This facet is probably formed for articulation with a rudimentary cervical rib which might have occurred in the lower part of the scalenus anterior muscle. The cervical rib was probably better marked on the right side corresponding to the better-marked facet. However, examination of the seventh cervical vertebra does not reveal any evidence of the dorsal moiety of a cervical rib. Hence, it is surmised that only a ventral part of a rudimentary cervical rib or a bony nodule was present in the scalenus anterior at its inferior attachment to cause the formation of the observed facet.

The groove for the subclavian vein is particularly well marked, giving the appearance of a fossa.

CLAVICLE AND SCAPULA

Clavicle (Pl. 64, No. 8).—The right clavicle of the female skeleton from Site VII is intact and is 129 mm. in length. The lateral end of the left clavicle is broken. A fragment of the right clavicle from Site VIII is available, but is of little additional significance.

The clavicle generally resembles a recent bone except that it appears to be shorter as compared with a large number of dissection-room bones. Another noticeable feature is the marked ridging of the posterior lip of the subclavian groove; this is present on both sides and would indicate a strong fascial attachment.

Scapula (Pl. 64, No. 8).—The right scapula of the female skeleton from Site VII is practically intact except for injury to the upper border; the tip of the coracoid process is also broken. There is an exostosis at the antero-inferior segment of the glenoid cavity. The left scapula is partly destroyed especially along its medial and superior borders. The scapulae of the male skeleton from Site VIII are not available.

In general appearance the scapula resembles a recent scapula. But the supra-scapular notch is very shallow as compared with modern bones. The upper, narrower part of the pyriform glenoid fossa encroaches on to the root of the coracoid process so that the line representing the longest diameter of the glenoid fossa seems to be definitely inclined, with its upper end tilted ventrally or anteriorly. The significance of this is probably dependent on some accustomed position of the upper limb for frequent manual work with perhaps arms hanging slightly flexed with some amount of abduction at shoulder or some position that requires a forward and upward migration of the head of the humerus over the glenoid fossa. The inferior part of the axillary border is drawn out laterally as a distinct flattened triangular process to provide extra area for the origin of teres major muscle. This bony process is occasionally seen in modern scapulae.

The bony ridges running obliquely in the subscapular fossa are very distinctly ridged indicating attachment of strong intermuscular septa. Further the subscapular fossa shows a reniform excavation in its middle giving the appearance of a fossa within a fossa. This also is probably caused by the accommodation of a powerfully acting muscle.

BONES OF THE UPPER LIMB

Humerus (Pl. 64, No. 9).—Of the bones of the female skeleton from Site VII the left humerus is intact except for a break on the lateral aspect about 3 cm. below the greater tuberosity. The right humerus shows a wide gap at the antero-lateral aspect of the upper end interrupting that aspect of the tubercles and part of the head. Of the bones of the male skeleton from Site VIII, only the lower part of the right humerus is present, its upper end having been destroyed.

The left humerus of the female is 310 mm. in length. Both bones show elliptical supratrochlear foramen of about 5 mm. in transverse diameter. The carrying angle is about 164° and the angle of humeral torsion is 43°. These are definitely in a primitive condition and are similar to those of Australians when compared with the data given by Wilder (1920). The bones are comparatively sturdier in comparison with modern specimens.

Ulna (Pl. 64, No. 9).—The left ulna of the female is intact, but only the lower part of the right ulna, a fragment about 13 cm. long, is present. Of the male skeleton a fragment of the upper end and a separate middle piece of the right ulna and a fragment of the lower end left ulna, 12 cm. long, are available. The length of the left ulna (female) is 254 mm.

The distal articular facet of the ulna is longer antero-posteriorly than transversely. The styloid process is well marked and projects for 6 mm. The groove for the extensor carpi ulnaris between the dorsal aspect of the head of the ulna and the base of the styloid process is clearly seen. The ulnae are relatively sturdy when compared with recent bones.

Radius (Pl. 64, No. 9).—Both the bones of the female are intact; a 5 cm. fragment from the upper end of the right radius and the whole of the left radius, apart from a break in the radial head, are available for the male skeleton.

The right radius of the female is 238 mm. and the left 236 mm. long. When the bones are placed together side by side the right radius is noticed to be distinctly (2 mm.) longer. This is a definite indication that the individual when alive was right-handed. There are distal articular facets for the carpal bones (navicular and lunate). The styloid process is well marked.

Bones of the wrist and hand.—In the female skeleton, except for the pisiform, all the other carpal bones are available for study; the scaphoid, lunate, capitate and hamate of both sides, and the trapezium, trapezoid and triquestrum of the left are present. The metacarpal set is complete and most of the phalanges are also available.

In the case of the male skeleton there is a composite mass consisting of the right carpus and parts of second, third, fourth and fifth metacarpals and a displaced phalanx. There is a composite fragment of the right first metacarpal, with its two phalanges and the distal part of the second metacarpal and the proximal phalanx. There is another composite fragment of the left trapezoid, capitate and hamate together with the second, third, fourth and part of the fifth metacarpal together with a displaced middle and terminal phalanx adhering to the ventral aspect of the distal part of the metacarpals. The bony configurations are easily visible in this fragment. In addition there is an isolated left scaphoid, a distal piece of the left first metacarpal, and some of the phalanges.

All the bones are sturdily built and belong to what may be conjectured as large hands, especially those of the male. The proximal surface of the first metacarpal shows the characteristically human saddle-shaped surface.

PELVIS

Hip bone (Pl. 64, No. 10).—Both the hip bones of the female skeleton from Site VII are available. The medial part of the pubis of the right bone and the posterior border of the ilium of both bones are injured. Only fragments of the hip bones of the male skeleton from Site VIII are available.

The hip bones of the skeleton from Site VII show definitely feminine characters in the pubic angle and the greater sciatic notch. The preauricular sulcus is also well marked. The hip bones of the skeleton from Site VIII are definitely male in their features.

As compared with dissection-room specimens, the bones are more sturdy, especially the ischium. The ilium is relatively higher and its anterior border between the anterior superior and anterior inferior iliac spines is less concave, i.e. the border is more even. Again the anterior inferior iliac spine does not appear to be as clearly demarcated and defined as a tubercle. If this last feature is an indication of the weakness of the attachment of the straight head of the rectus femoris and the ilio-femoral ligament then it might have an evolutionary significance.

Confluent with the pubic tubercle is a bony process projecting forwards and downwards representing an ossified part of the origin of adductor longus muscle.

BONES OF THE LOWER LIMB

Femur (Pl. 64, No. 11).—Both femora of the female skeleton are available. The left bone is damaged in the lower part of the head and in the anterior and medial parts of the lower end. The right bone is slightly damaged on the posterior aspect of the upper part of the shaft, at a point about its upper third and also on the anterior aspect of the lower end above the medial condyle. Both femora of the male skeleton are present; the lower end of the left bone is damaged at the sides and the lower end of the right bone is totally destroyed. The head of the femur measures in the vertical and transverse diameters respectively 37 and 38 mm. in the female and 44 and 44 mm. in the male.

In the anterior and lower part of the inter-trochanteric line in the male bone is a diffusely elongated tubercle extending above to the neck of the femur and below the inter-trochanteric line on to the shaft. This suggests that the neck of the femur has an extra buttress in front, possibly the result of a frequently adopted attitude of crouching while in a standing posture.

The antero-posterior curve of the shaft is very well marked, the greatest convexity of the female bone, which has a physiological length of 430 mm., being 6·0 cm. above the plane surface on which it was measured. In the male bone too the curve is characteristic, but, as the lower ends of both femora are injured, an accurate estimate could not be made of it.

The linea aspera is very well marked, especially in the male bone. About the middle of the shaft the antero-posterior diameter is 31 mm. and the transverse diameter 26 mm.

The lower articular surface resembles dissection-room specimens, but the anterior articular area for the patella shows an increased excursion on its lateral edge. The fossa for the origin of the tendon of the popliteus muscle, the grooves lodging the tendon in the flexed and extended positions of the knee, the narrow semilunar facet on the lateral aspect of the medial condyle facing the inter-condylar fossa and articulating with the medial perpendicular facet of the patella in extreme flexion, the adductor tubercle, etc., are well marked.

Patella.—Both patellae of the female skeleton and the right patella of the male skeleton are available for study.

The dimensions of the bones are given below:—

		Female	Male
Vertical diameter	..	35 mm.	44·5 mm.
Transverse diameter	..	40 mm.	43·5 mm.
Antero-posterior diameter	..	18·5 mm.	21·5 mm.

The general features are similar to recent bones. The posterior articular surface is divided into a larger lateral and a smaller medial area. The medial extremity of the medial articular area is directed medially and slightly backwards. This is the facet that comes into contact with the medial condyle of the femur in extreme flexion of the knee. The lower 5 mm. of the lateral part of the articular surface is demarcated from the rest of the lateral area by a distinct rounded border. This facet is probably caused by the extreme flexion in squatting. These facets are, however, noticeable in local dissection-room bones.

The patella of the male skeleton is slightly distorted so that the longest supero-inferior diameter is slightly oblique, the lateral area having a higher extension.

Tibia (Pl. 64, No. 11).—Both tibiae of the female skeleton are preserved in reasonably good condition except for a slight injury to the lateral aspect of the lower third of the right bone. Both tibiae of the male skeleton are badly damaged at the upper and lower ends. The middle of the left male tibia has a part of the fibula adherent to it. The adhesion was not separated.

The lengths of the female tibiae are 366 mm. (right) and 365 mm. (left).

The bone is definitely more massive than the dissection-room specimens. The anterior margin presents a characteristic sinuous curve better marked than in modern tibiae. The anterior margin is also particularly sharp especially in its middle half. The area for the origin of the tibialis anterior is especially marked and hollowed out in the male bone. The nutrient foramen is situated at the usual position. The lower end shows the usual features. There is an extension of the inferior articular surface of the tibia to the lateral aspect of the shaft seen in the right bone (the left bone is injured here) indicating the presence of a large synovial cavity at the distal tibio-fibular joint in continuity with the synovial cavity of the ankle joint. The anterior edge of the lower end of the tibia presents about its middle a well-marked semilunar articular facet and medial to it a marked articular groove extending on to the medial malleolus (Pl. 64, No. 12). These are squatting facets of the tibia and definitely indicate the posture of squatting commonly adopted by the people represented.

Fibula (Pl. 64, No. 11).—Of the female skeleton an intact right fibula slightly defective towards the lower part of the shaft, and the upper two-thirds of the left fibula are available. In the male skeleton a portion of the middle of the shaft of the left, adhering to the corresponding tibia, is the only fragment available. The length of the fibula of the female is 344 mm.

The fibula generally resembles recent bones. It displays a well-marked curve with a lateral concavity and a medial convexity. This might indicate a hypertrophy of the lateral crural musculature or a distortion due to constant sitting or squatting in a particular position so as to cause an inward curving of the fibula.

Bones of the foot.—Of the female skeleton both calcanea, tali, scaphoids, cuboids, medial cuneiforms, lateral cuneiforms, and the left intermediate cuneiform are available. All the metatarsals and a large number of phalanges are also present. Of the male skeleton a composite fragment of the right talus together with adhering distal ends of the tibia and fibula, a fragment of the right scaphoid, a partly injured right cuboid, a united fragment of right first and second cuneiforms, a right third cuneiform, fragments of some of the metatarsals and some of the phalanges are available for study.

The bones have the general characteristic human appearance of modern bones. The tali of both sides show a forward displacement of the medial articular facet for the medial malleolus clearly indicative of an adaptation to the squatting posture. The sustentaculum tali of the calcaneum is more pronounced. There is a general impression that while the hand was larger than modern bones of average size, the foot is not so. It is difficult to conjecture if this has any racial significance or is only an individual feature, until more specimens are available for study.

STATURE

Even on a cursory examination by comparison with recent dissection-room bones one can infer that the male was tall and the female was above the average height. It was thought worth while to settle this point more precisely.

Male stature was estimated from the maximum length of the more intact femur, viz. 479 mm., according to the general formula of Dupertius and Hadden (1951) and gave a reconstructed stature of 176·3 cm., which places the subject in the 'tall' category of anthropologists. Similarly reconstructed from the length of the left humerus and the mean lengths of both radii, the stature of the female was 164·5 cm. The sexual difference of 11·8 cm. is of the usual order.

THE CHILD'S BONES

Age of the child.—The union of the two halves of the neural arches of the typical vertebra would indicate, according to modern standards, that the child was above two years. This tallies with the completed union of the two frontal bones at the metopic suture. The milk teeth have all erupted but the second milk molar and canine not fully. The levelling up of the teeth in the dental arcade takes place only after the age of two. The calcification of the crown of the permanent second maxillary molar is given in modern textbooks as varying from two to four years. We cannot say how far these modern data are precisely applicable to ancient specimens. This tooth has begun to calcify and has already calcified to a certain extent. The four parts of the occipital bone unite to form a single bone by four years. The union of the occipital moieties has not taken place in this child. So the age of the child is above two years and below four, probably three to four years.

The child's skull.—Parts of the parietal bones, a fragment of the frontal bone, a part of the ex-occipital showing the margin of the foramen magnum and groove for the sigmoid sinus over the jugular-process, a basi-occipital showing the anterior margin of the foramen magnum, the right temporal bone, a portion of the left temporal bone and a small part of the sphenoid showing distinctly the foramen ovale as well as the foramen spinosum, were available.

From the many fragments of the cranial vault one can note the inner and outer tables and the small quantity of diploe between. But the material is not sufficient to reconstruct the form of the skull. No inference can therefore be made of cranial capacity. The two frontals have united. The groove for the superior sagittal sinus is evident. The grooves for the cerebral gyri are impressed on the inner table. The parietal eminences and one frontal eminence are visible in the fragments available. The sagittal suture is well serrated. The temporal bone shows the usual features, viz. the eminentia arcuata, tegmen tympani, jugular fossa, carotid canal, internal auditory meatus, aquaductus vestibuli, aquaductus cochlea, mastoid process, digastric fossa, etc.

The floor of the external auditory meatus seems to be better ossified than in a corresponding modern bone. The lateral edge is thick and rough for the attachment of the cartilage of the pinna. The edge gives the appearance of very strong attachment of the cartilage.

The zygomatic bones are present and appear to be more massive than comparable recent bones.

Incus.—A right incus, one of the ossicles of the ear, was obtained from within the middle ear. The body of the incus is stouter and its processes are less delicate than in modern bones. A wider angle is subtended between the two processes.

The child's mandible.—The bone appears to be comparatively sturdier. The bigonial breadth is 65 mm. and the rameal height 33 mm.

Teeth.—The milk teeth seem to have all erupted though the second molar and canine have not attained the proper level of the arcade.

Two calcified left upper permanent molars are missing from out of the maxilla. These are the partially calcified crowns of the first permanent molar and the second permanent molar. The first permanent molar has a bucco-lingual diameter of 10 mm., antero-posterior diameter of 10·5 mm. and a maximum diagonal diameter of 11·5 mm. In this tooth the crown and part of the neck are calcified. The total vertical height that is calcified is 7 mm. The second permanent molar has a bucco-lingual diameter of 11 mm., antero-posterior diameter of 11·5 mm. and a maximum diagonal diameter of 13 mm. In this tooth only the crown is calcified and the calcified vertical height is 5 mm. The interesting feature is that the second molar crown is larger than that of the first while the first as is to be expected is more calcified in vertical extent. Apart from the apparent difference of 7 mm. and 5 mm., the first molar appears to be well formed while the second molar crown is only a flake. The larger size of the second molar crown is peculiar. Usually in modern teeth the first crown is larger than the second and even in the molar teeth of the Piklihal adults male and female, the crown of the first is larger than that of the second. This particular observation in this neolithic child is perhaps an individual peculiarity.

Other bones.—Among the child's bones some fragments of centra and neural arches of the vertebra are available. The neural arches are not united to the centra, but the halves of the neural arches on each side have united. The terminal parts of the spinous processes and the tips of the transverse processes are not yet ossified.

A small fragment of the upper part of the manubrium sterni and many fragments of ribs and nearly the whole of a typical rib are present.

A fragment of the left clavicle is available. The left scapular is found partly broken in the infero-medial part. The glenoid cavity appears to be transversely wider; the crenation on the ventral edge is well marked.

The shaft of the left humerus and the middle part of the shaft of the right humerus, and about half the upper part of the left ulna and the upper half of the shaft of the left radius are available. The bones appear sturdier than comparable recent bones.

An ischial fragment of the hip bone of the child's skeleton is available. A small middle fragment of the left femur and an upper fragment of the right femoral shaft are available. The bones indicate a comparatively more robust make-up.

CONCLUSION

The skeletal remains excavated at Piklihal, apart from their mineralization and fragility, will be recognized by any experienced anatomist to be peculiar specimens if found mixed with any set of modern or recent bones in an anatomical laboratory. The bones are in general more robustly built. In some characters of the humerus and femur the bones show primitive features. In many other characters, especially in the upper limb and lower limb bones, they show features probably indicative of the ecology of the people, their food habits, their way of life and work, and mode of squatting and locomotion. However, the large cranial capacity, the well formed chin, and the typical human lumbar vertebral column are characteristically advanced and would place these people on a par with any moderns. The occurrence together of skulls of considerably different cranial index may possibly suggest that the people were already a mixed population. The fact that the bones are definitely more sturdily built raises the question whether the cause is genetic or due to hard muscular work. It is very probable that it is a genetic character as the child's bones also reveal the same comparative robustness in formation. Even the child's incus, one of the small ossicles in the middle ear, is more robust than that from a recent subject. Doubtless the sturdy bones could also reflect diet.

We feel justified in assuming that the people represented by these skeletal remains were a tall, sturdy people with large cranial capacity and a variable head form. These could be the ancestors of a major element of the present mixed so-called Dravidian inhabitants of the Deccan and Southern India.

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Titles for Additional Plates

PL. 61. Female skull from Site VII: No. 1. Anterior view; No. 2. Superior view; No. 3. Side view, post-mastoid region is out of vision; No. 4. Side view; No. 5. Mandible seen from above.

PL. 62. Profile contour of Piklihal skull superposed on Zuckerman's profile contours of Adichanallur, Australian and Tamil skulls.

PL. 63 Profile contour of Piklihal male and female skulls.

PL. 64. Female skeleton from Site VII: No. 8. Clavicle and scapula; No. 9. Humerus, radius and ulna; No. 10. Hip bone; No. 11. Femur, tibia and fibula; No. 12. Lower end of right tibia, anterior view.